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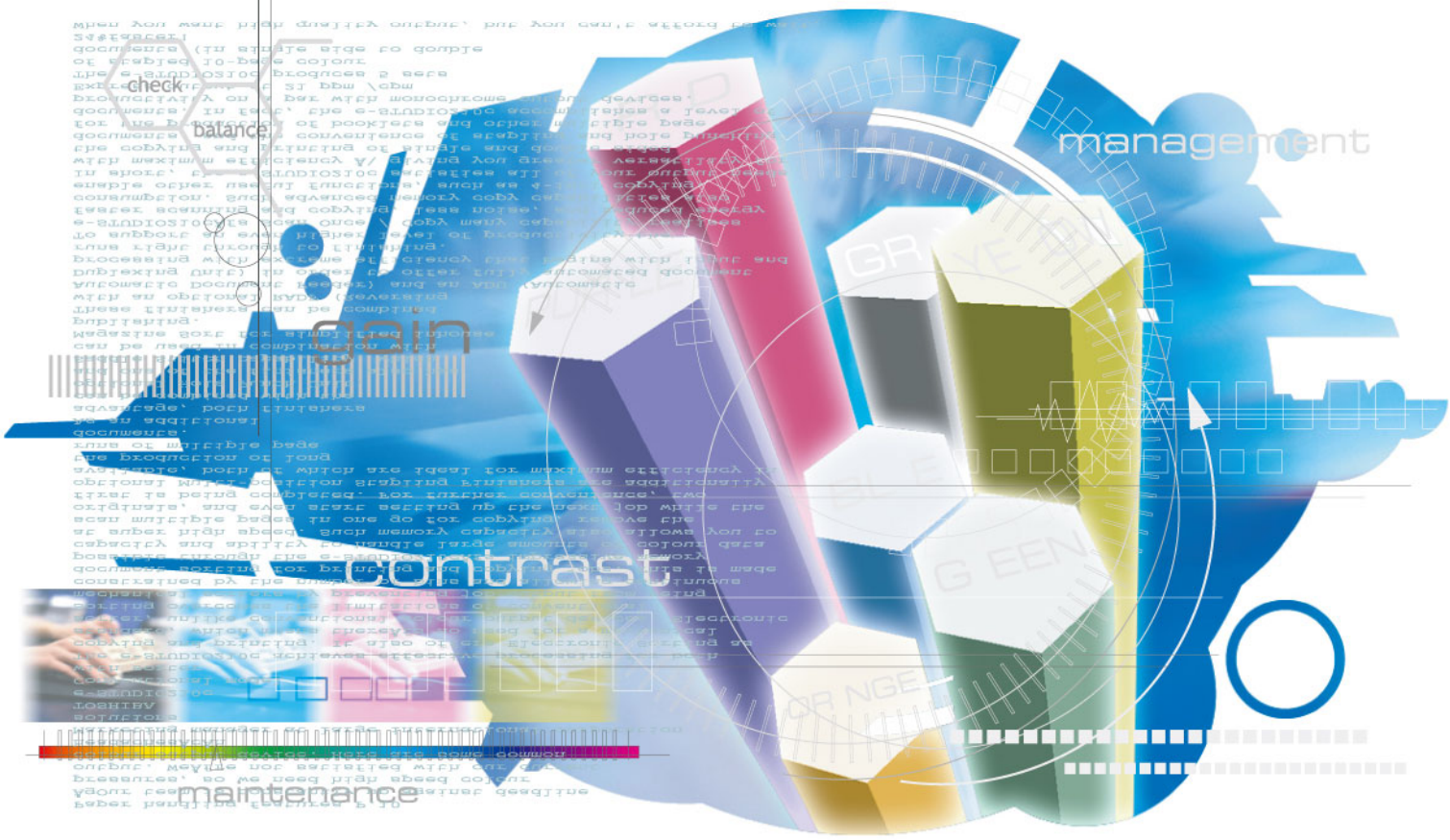
e-STUDIO2330c/2820c/2830c/ 3520c/3530c/4520c

Satisfying Specific Customer Needs for Designed Image Quality

Imaging Manual



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Purpose of the Imaging Manual

The Imaging Manual is intended for customers using the Toshiba e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C with a variety of specific needs and inquiries for high image quality, such as:

- How to obtain a clearer copy image
- How to maintain the current image quality
- How to make the text look sharper on the copy

The Toshiba MFPs are factory-configured to provide image quality settings that satisfy the majority of customers. However, these settings may not be necessarily optimal for the specific needs of all customers. Proper image quality adjustments can satisfy such needs. Most of the adjustments described in this manual must be performed by a service technician, but a few of them can also be performed by the customer.

It is strongly recommended that this manual be fully utilized by not only the service technician, but also the sales representative, who also has opportunities of obtaining customer feedback on the image quality. This manual helps the sales representative to study and comprehend what kind of customer requirements for image quality can be satisfied, to make proposals to customers to improve image quality, and to communicate the customers' specific requirements with ease to the service technician. In addition, this manual is expected to facilitate the marketing of Toshiba MFPs to prospective customers that have a specific demand for image quality and the expansion of sales.

The adjustments described in this manual are all based on the requests of actual customers. Meeting their specific wishes will only add to their satisfaction.

Please remember to read "Precautions after the completion of the adjustment," to which you must pay close attention, after finishing the adjustment.

Precautions in Servicing

- For adjustments to be performed by the service technician, the precautions given in the Service Manual must be stringently followed. The adjustments must be performed by a qualified service technician who has completed the service training course.
- The default listed mentioned in this manual may be different from the actual ones, due to the timing of shipping (firmware version). But note that the recommended values and acceptable value range stated in this manual remain the same.

Icons

The following icons used in this manual denote the following:

: • Copy ——— An adjustment having an effect on copying in the Black mode (excluding the Image smoothing mode)
• Printer ——— An adjustment having an effect on Black and White mode printing
* The adjustment will be effective, if "Black and White" is selected from among the "Color" options on the Windows printer driver or if "Mono" is selected from among the "Color Type" options on the Macintosh print dialog.
• Scan ——— An adjustment having an effect on scanning in the Black mode

: • Copy ——— An adjustment having an effect on copying in the Image smoothing mode in the Black mode
• Scan ——— An adjustment having an effect on scanning in the Gray scale mode

: • Copy ——— An adjustment having an effect on copying in the Full color mode
• Printer ——— An adjustment having an effect on full-color printing
* The adjustment will be effective, if "Auto" or "Color" is selected from among the "Color" options on the Windows printer driver or if "Auto" or "Color" is selected from among the "Color Type" options on the Macintosh print dialog.
• Scan ——— An adjustment having an effect on scanning in the Full color mode

: • Copy ——— An adjustment having an effect on copying in the Auto color mode
• Scan ——— An adjustment having an effect on scanning in the Auto color mode

PCL6 : An adjustment having an effect on printing with the Windows PCL6 emulation printer driver

PS3 : An adjustment having an effect on printing with the Windows PS3 emulation printer driver

XPS : An adjustment having an effect on printing with the Windows PSX emulation printer driver

Mac : An adjustment having effect on printing with the Macintosh printer driver

Scan to Box : An adjustment having an effect on an image stored in the e-Filing box by the scanning functions (including Scan to Box, Scan to File and Scan to E-mail)

Copy to Box : An adjustment having an effect on an image stored in the e-Filing box by the copying functions (Copy to Box)

Print to Box : An adjustment having an effect on an image stored in the e-Filing box by the printing functions (Print to Box)

Fax to Box : An adjustment having an effect on an image stored in the e-Filing box by the Fax and Internet Fax functions (including Received Fax to Box and Received Internet Fax to Box)

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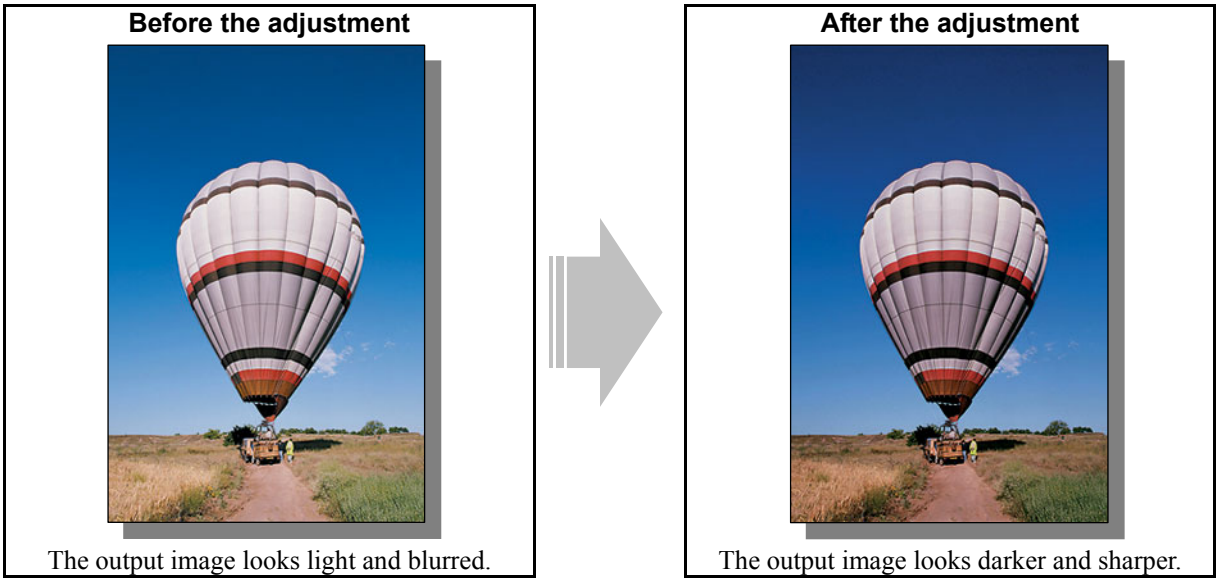
1.1 To Obtain a Darker Image


Before the adjustment
The output image looks light and blurred.
After the adjustment
The output image looks darker and sharper.

❑ Explanation

When an original containing photo images or gradational images is printed, the output image sometimes looks light and blurred. Perform image quality control or automatic calibration, and adjust the transfer roller bias output, in order to obtain a darker and sharper image.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Only the service technician must use procedures (1), (3) and (4).
* Both the service technician and the user can use procedure (2).

(1) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be forcibly performed to correct variations in density.

After exercising image quality control, use the next procedure.

(2) Perform automatic calibration to correct variations in image density.

* "ADMIN" is selected from among the "CALIBRATION DISPLAY LEVEL" options by default. In other words, an administrator is authorized to operate automatic calibration. But "USER" can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the "CALIBRATION DISPLAY LEVEL" option.

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To adjust the copy image quality

Use steps (a) through (i) to perform automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [ADMIN] tab.
(c) Enter the 6 to 10 digit administrator password. Press the [ENTER] button.
(d) Press the [GENERAL] button.
(e) Press the [CALIBRATION] button.
(f) Press the [COPY] button.
(g) Press the [CALIBRATION] button to print out the test chart.
(h) Place the printed test chart on the original glass.
(i) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.

* As a result of the above steps, the copy image quality will be corrected in the Full Color mode and Black and White mode simultaneously.

* To correct variations in image density by performing automatic calibration for each paper type, refer to “(1) Perform automatic calibration for each paper type to correct variations in image density” in “2.13 To Obtain a Good Color Balance on Thick Paper”.

To adjust the print image quality

Use steps (a) through (j) to perform automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [ADMIN] tab.
(c) Enter the 6 to 10 digit administrator password. Press the [ENTER] button.
(d) Press the [GENERAL] button.
(e) Press the [CALIBRATION] button.
(f) Press the [PRINT] button.
(g) Press the [CALIBRATION] button to print out the test chart.
(h) Place the printed test chart on the original glass.
(i) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.
(j) The message "Is a result made to reflect?" will appear. Press the [YES] button.

* To correct variations in image density by performing automatic calibration for each paper type, refer to “3.2 To Maintain a Steady Color Balance on Thick Paper or Special Paper”.

After performing automatic calibration, print and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(3) Enter adjustment mode [05]. Change the values for codes [2934 to 2937] to adjust the transfer (2nd transfer) roller bias output.

(Adjust the offset voltage of transfer roller bias so as to increase the density of the image.)

• The code to use varies according to the paper type. Adjust the value for [05] code corresponding to the paper type for which you would like to improve the image quality. Set the value within a range of "2" to "8" to obtain the highest density of the image.

Paper type			[05] code	Subcode	Recommended value	Acceptable value range	Default
Full color	Front	Plain paper	05-2934	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			
	Back	Plain paper	05-2935	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			
Black	Front	Plain paper	05-2936	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			
	Back	Plain paper	05-2937	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			

* "Front" refers to the printed side in the simplex mode or the side that is delivered facing downwards in the duplex mode.

"Back" refers to the printed side that is delivered facing upwards in the duplex mode.

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* The table below shows you the acceptable paper weight for the paper type.

Paper type	Acceptable paper weight	
Plain paper	64 to 105 g/m²	16 to 20 lb. Bond
Thick 1	106 to 163 g/m²	Max. 60 lb. Cover
Thick 2	164 to 209 g/m²	Max. 110 lb. Index
Thick 3	210 to 256 g/m²	Max. 140 lb. Index
Thick 4	257 to 280 g/m²	Max. 150 lb. Index

• After adjusting the transfer roller bias output, perform automatic calibration in the same manner as in procedure (2).

<Hint> The transfer voltage increases as the set value is increased. It is usually recommended that the set value be increased, when you print on thick paper or paper with asperities on its surface. On the other hand, the set value should be decreased, when you print on thin paper.

After adjusting the density, print and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Check the life of the consumables (particularly the drum, developer material and fuser unit) and replace them, if necessary.

• When replacing any consumable, use steps (a) to (c).

(a) Enter the PM support mode. Reset the counter corresponding to the replaced consumable to "0."
* For further information regarding the PM support mode, refer to the Service Manual.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.
• Image quality control will be performed and the image quality control value will be initialized.

(c) Perform automatic calibration in the same manner as in procedure (2).

* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

• Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

• If printing on another type of paper causes a problem with the image quality after the adjustment, return the set values (for codes 05-2934 to 2937) to the default (set value: 5) and then perform the adjustment again.

• When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

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1.2 To Adjust the Density of an Entire Copy

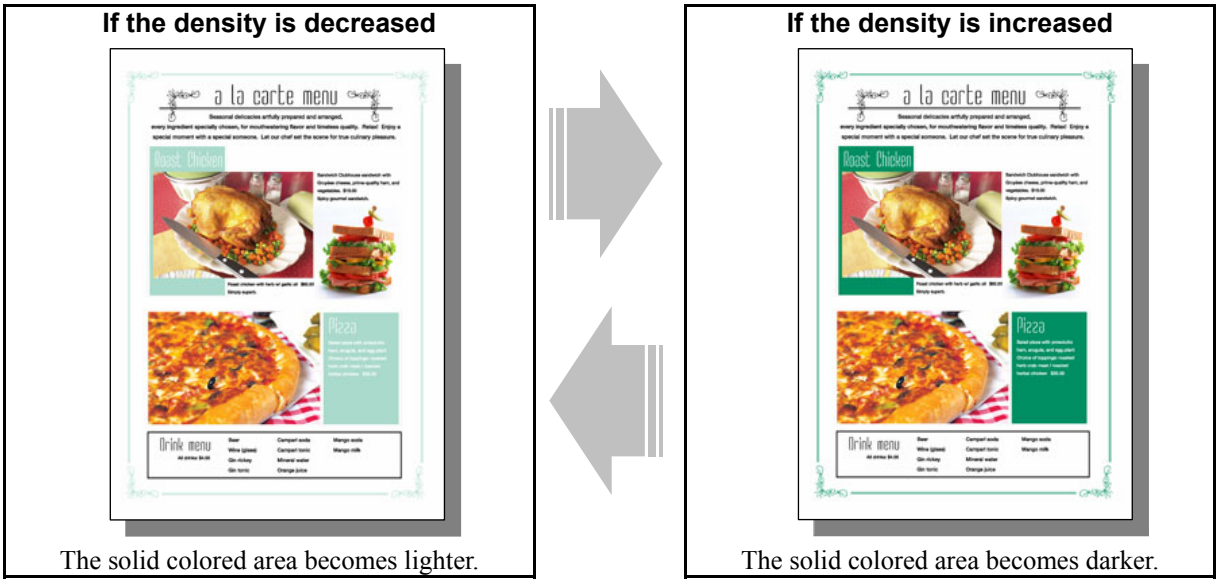
❑ Explanation

The density on a solid colored image and a photo or gradational image (halftones) can be adjusted as desired by the user.

❑ Procedures

* The use procedure varies, depending on whether you are going to adjust the density on a solid colored image or a photo or gradational image. Refer to "To Adjust the Density on a Solid Colored Image" in order to adjust the density on a solid colored image. Refer or "To Adjust the Density on a Photo or Gradational Image" in order to adjust the density on a gradational image (halftones).

1.2.1 To Adjust the Density on a Solid Colored Image



❑ Explanation

A particular color can be intensely darker or lighter, depending on the type of paper or original used. Adjust the developer bias output, in order to adjust the amount of toner on the solid colored area and obtain the image quality the user desires.

❑ Procedures

* The service technician must perform the adjustment in accordance with the procedures below.

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(1) Enter setting mode [08]. Change the value to adjust the density of a solid area during the copying/printing operation.

• Use steps (a) to (c) to perform the adjustment.

(a) Enter setting mode [08]. Change the values for codes [2513 to 2515] to adjust the developer bias output value.

• Decreasing the value will make the solid colored area become lighter (decrease the amount of toner on the solid colored area). On the other hand, increasing the value will make the solid colored area become darker (increase the amount of toner on the area).

* The value to use varies according to the paper type and color to adjust. Check the code to use in accordance with the following "Code" list, and refer to the "Value" list to select a proper value.

Code

Paper type		Color to adjust	[08] code	Subcode
Full color	Plain paper	Y (yellow)	08-2513	0
		M (magenta)		1
		C (cyan)		2
		K (black)		3
	Thick	Y (yellow)	08-2514	0
		M (magenta)		1
		C (cyan)		2
		K (black)		3
Black			08-2515	---

Value

Value	Correction value for developer bias output	Density of the solid colored area
0	Value automatically set −100	Light
1	Value automatically set −80	↑
2	Value automatically set −60	↑
3	Value automatically set −40	↑
4	Value automatically set −20	↑
5	Value automatically set	↑
6	Value automatically set +20	Default
7	Value automatically set +40	↓
8	Value automatically set +60	↓
9	Value automatically set +80	↓
10	Value automatically set +100	Dark

<Hint> Adjust the values for the following codes, in order to adjust colors with RGB.

Adjustment of R (Red): Adjust Y (Yellow) and M (Magenta).
Adjustment of G (Green): Adjust Y (Yellow) and C (Cyan).
Adjustment of B (Blue): Adjust M (Magenta) and C (Cyan).

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be forcibly performed and the image density will be corrected.

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<Note> The above corrections will be effective immediately after the values for codes [08-2513 to 2515] are changed. After changing the values for codes [08-2513 to 2515], remember to perform image quality control for code 05-396.

(c) After completing image quality control, print and check the print image quality.

Repeatedly use steps (a) to (c) as necessary, to select a proper value.
If further image quality adjustments are still necessary, use the next procedure.

(2) Check the life of the consumables (particularly the drum, developer material and transfer belt unit) and replace them, if necessary.

• When replacing any consumable, use steps (a) to (b).

(a) Enter the PM support mode. Reset the counter corresponding to the replaced consumable to "0."

* For further information regarding the PM support mode, refer to the Service Manual.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be performed and the image quality control value will be initialized.

* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

❑ Precautions after the completion of the adjustment

• The adjustment may possibly cause an increase in the amount of toner consumed, scattering of the toner, diminished photo images or gradations (less accurate reproducibility of halftones), extremely dark images (decreased resolving power), extremely light images (faint thin lines), and shorten the life of the consumables. Therefore, carefully perform the adjustment, while checking the copy or print image.

• No effect of the adjustment may appear, depending on the operating environment of the MFP. Therefore, carefully perform the adjustment, while checking the copy or print image.

❑ Remarks

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the MFP.

• When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

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1.2.2 To Adjust the Density on a Photo or Gradational Image

If the density is decreased

An original containing halftones, such as a photo image becomes lighter.

If the density is increased

An original containing halftones, such as a photo image becomes darker.

❑ Explanation

A particular color can be intensely darker or lighter, depending on the type of paper or original used. Adjust the intensity of the laser, in order to adjust the density on the photo or gradational image (halftones) and obtain the image quality the user desires.

❑ Procedures

* The service technician must perform the adjustment in accordance with the procedures below.

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(1) Enter setting mode [08]. Change the value to adjust the image density of halftones during the copying/printing operation.

• Use steps (a) to (c) to perform the adjustment.

(a) Enter setting mode [08]. Change the values for codes [2525 to 2525] to correct the intensity of the laser.

• Decreasing the value will make a photo or gradational image become lighter, easily blurring the image, but it will increase the gradation. On the other hand, increasing the value will make the photo or gradational image become darker and clearer, but it will decrease the gradation.

* The value to use varies according to the paper type and color to adjust. Check the code to use in accordance with the following "Code" list, and refer to the "Value" list to select a proper value.

Code

Paper type		Color to adjust	[08] code	Paper type
Full color	Plain paper	Y (yellow)	08-2525	0
		M (magenta)		1
		C (cyan)		2
		K (black)		3
	Thick	Y (yellow)	08-2526	0
		M (magenta)		1
		C (cyan)		2
		K (black)		3
Black			08-2527	---

Value

Value	Correction value for intensity of the laser	Density on the photo/gradational image
0	Value automatically set −100	Light (gradation: more)
1	Value automatically set −80	↑
2	Value automatically set −60	↑
3	Value automatically set −40	↑
4	Value automatically set −20	↑
5	Value automatically set	Default
6	Value automatically set +20	↓
7	Value automatically set +40	↓
8	Value automatically set +60	↓
9	Value automatically set +80	↓
10	Value automatically set +100	Dark (gradation: less)

<Hint> Adjust the values for the following codes, in order to adjust colors with RGB.

Adjustment of R (Red): Adjust Y (Yellow) and M (Magenta).

Adjustment of G (Green): Adjust Y (Yellow) and C (Cyan).

Adjustment of B (Blue): Adjust M (Magenta) and C (Cyan).

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(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.
• Image quality control will be forcibly performed and the image density will be corrected.

<Note> The above corrections will be effective immediately after the values for codes [08-2525 to 2527] are changed. After changing the values for codes [08-2525 to 2527], remember to perform image quality control for code 05-396.

(c) After completing image quality control, print and check the print image quality.

Repeatedly use steps (a) to (c) as necessary to select a proper value.
If further image quality adjustments are still necessary, use the next procedure.

(2) Check the life of the consumables (particularly the drum, developer material and transfer belt unit) and replace them, if necessary.
• When replacing any consumable, use steps (a) to (b).
(a) Enter the PM support mode. Reset the counter corresponding to the replaced consumable to "0."
* For further information regarding the PM support mode, refer to the Service Handbook.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.
• Image quality control will be performed and the image quality control value will be initialized.

* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

❑ Precautions after the completion of the adjustment

• The adjustment may possibly provide extremely dark images (decreased resolving power, inadequate reproducibility of gradations), and extremely light images (blurred images, faint thin lines). Therefore, carefully perform the adjustment, while checking the copy or print image.

• No effect of the adjustment may appear, depending on the operating environment of the MFP. Therefore, carefully perform the adjustment, while checking the copy or print image.

❑ Remarks

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the MFP.

• When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

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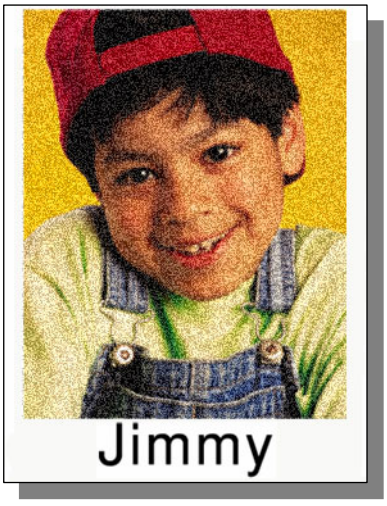
1.3 To Achieve the Image Quality Most Suitable for the Paper Used

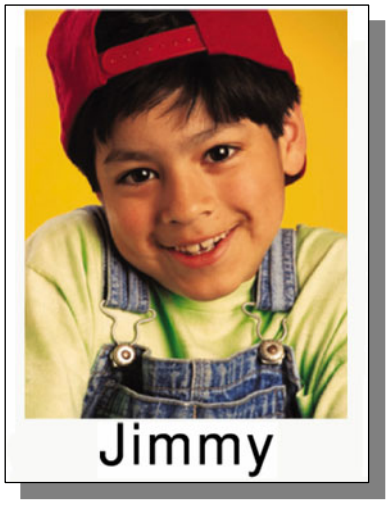
(To eliminate blur and graininess from an image)

Before the adjustment



The image looks grained, depending on the type of paper.

After the adjustment



A clear image quality, most suitable for a type of paper used, is obtained.

❑ Explanation

The image sometimes looks slightly blurred or grained on the copy or printout, depending on the type of paper used. Adjust the transfer roller bias output and the fuser temperature, in order to achieve the image quality most suitable for the paper used.

❑ Procedures

*All the steps in the adjustment must be performed by the service technician. The procedure to be followed differs depending on the purpose as follows:

- To adjust halftone image: Go to step (1)
- To adjust images on the high-density area (only when recycled paper is used): Go to step

(1) Enter adjustment mode [05]. Change the values for codes [2934 to 3937] to adjust the transfer (2nd transfer) roller bias output.
(Adjust the offset voltage of transfer roller bias so as to optimize the halftones.)

- The code to use varies according to the paper type. Adjust the value for [05] code corresponding to the paper type for which you would like to improve the image quality. Set the value within a range of "2" to "8" to optimize the halftones.

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Paper type			[05] code	Subcode	Recommended value	Acceptable value range	Default
Full color	Front	Plain paper	05-2934	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			
	Back	Plain paper	05-2935	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			
Black	Front	Plain paper	05-2936	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			
	Back	Plain paper	05-2937	0	2 to 8	0 to 10	5
		Thick 1		1			
		Thick 2		2			
		Thick 3		3			
		OHP		4			
		Special 1		5			
		Special 2		6			
		Recycled paper		7			
		Thick 4		8			

* "Front" refers to the printed side in the simplex mode or the side that is delivered facing downwards in the duplex mode.
"Back" refers to the printed side that is delivered facing upwards in the duplex mode.

* The table below shows you the acceptable paper weight for the paper type.

Paper type	Acceptable paper weight	
Plain paper	64 to 105 g/m²	16 to 20 lb. Bond
Thick 1	106 to 163 g/m²	Max. 60 lb. Cover
Thick 2	164 to 209 g/m²	Max. 110 lb. Index
Thick 3	210 to 256 g/m²	Max. 140 lb. Index
Thick 4	257 to 280 g/m²	Max. 150 lb. Index

• After adjusting the transfer roller bias output, perform automatic calibration.
* For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

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<Hint> The transfer voltage increases as the set value is increased. It is usually desirable that the set value be decreased to obtain a clearly highlighted area.

After performing the adjustment, print and check the image quality.
If further image quality adjustment is necessary, go to step (3).

(2) If the image on the high-density area looks grained on plain paper other than the TOSHIBA-recommended one is used, select "recycled paper" as a paper type.

* To select the paper type, refer to the Operator's Manual for Copying Guide.

• If fine adjustment of image quality in the recycled paper mode is required in accordance with the paper type, follow the steps from (a) to (b) below.

(a) Enter the adjustment mode [05]. Change the value of the codes [2934] to [2937] to adjust (2nd) transfer bias output. (In this step the transfer roller bias offset voltage is adjusted to print the high-density area or the halftone area of the image most clearly.)

Paper type			[05] code	Subcode	Recommended value	Acceptable value range	Default
Full color	Front	Recycled paper	05-2934	7	2 to 8	0 to 10	5
	Back	Recycled paper	05-2935	7	2 to 8	0 to 10	5
Black	Front	Recycled paper	05-2936	7	2 to 8	0 to 10	5
	Back	Recycled paper	05-2937	7	2 to 8	0 to 10	5

* "Front" refers to the printed side in the simplex mode or the side that is delivered facing downwards in the duplex mode.
"Back" refers to the printed side that is delivered facing upwards in the duplex mode.

• After adjusting the transfer roller bias output, perform automatic calibration.

* Refer to step (2) in "1.1 To Obtain a Darker Image".

<Hint> The larger the setting value is, the more the transfer voltage increases. It is usually recommended that the set value be increased when you print on thick paper or paper with asperities on its surface. On the other hand, the set value should be decreased when you print on thin paper.

After setting the value, print and check the image quality.
If further image quality adjustment is necessary, go to step (b).

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(b) Enter the setting mode [08]. Change the value of the codes [5293] to [5296] to adjust fusing temperature in the recycled paper mode. (In this step fusing temperature is adjusted to print the high-density area of the image most clearly.)

Adjustment		Paper type	[08] code	Subcode	Recommended value	Acceptable value range	Default
Center heater	Normal temp / Black	Recycled paper	08-5293	0	3 to 8	0 to 16	• e-STUDIO4520c /4530c: 5 • Others: 4
	Normal temp / Color			1			
	Low temp / Black			2	3 to 8	0 to 16	• e-STUDIO4520c /4530c: 7 • Others: 6
	Low temp / Color			3			
Side heater	Normal temp / Black	Recycled paper	08-5294	0	3 to 8	0 to 16	• e-STUDIO4520c /4530c: 5 • Others: 4
	Normal temp / Color			1			
	Low temp / Black			2	3 to 8	0 to 16	• e-STUDIO4520c /4530c: 7 • Others: 6
	Low temp / Color			3			
Sub heater	Normal temp / Black	Recycled paper	08-5295	0	3 to 8	0 to 16	5
	Normal temp / Color			1			
	Low temp / Black			2	3 to 8	0 to 16	7
	Low temp / Color			3			
Pressure roller	Normal temp / Black	Recycled paper	08-5296	0	2 to 6	0 to 16	4
	Normal temp / Color			1			
	Low temp / Black			2	2 to 6	0 to 16	4
	Low temp / Color			3			

• After adjusting the fusing temperature, perform automatic calibration.

* Refer to step (2) in "1.1 To Obtain a Darker Image".

<Hint> The smaller the setting value is, the lower the fusing temperature becomes. It is usually recommended that the set value be decreased in order to suppress roughness on the high-density area of the image. Adjust the value while checking the image carefully because if the value is too small, insufficient fusing may occur.

Since temperatures on the long side of the paper cannot be kept in a proper balance, the same value must be set for the [08] codes [5293] and [5294] unless otherwise required so.

After setting the value, print and check the image quality.

If further image quality adjustment is necessary, go to step (3).

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(3) Check the life of the consumables (particularly the drum, developer material and fuser unit) and replace them, if necessary.

• When replacing any consumable, use steps (a) to (c).

(a) Enter the PM support mode. Reset the counter corresponding to the replaced consumable part to "0."

* For further information regarding the PM support mode, refer to the Service Manual.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be performed and the image quality control value will be initialized.

(c) Perform automatic calibration.

* For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

* After replacing any consumable, remember to reset the counter by making it correspond to "0." Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

❑ Precautions after the completion of the adjustment

After the fusing temperature was adjusted in step (2) above, printing interruption may occur due to improper fusing temperature. Therefore adjust the value carefully. If you want to change the conditions for printing interruption, change the value of the [08] code [5409] (abnormality process starting temperature setting / recycled paper). For the setting values, refer to the Service Manual.

❑ Remarks

• Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

• The desired image quality may not be obtained, depending on the type of paper used. In this case, use the recommended paper and then print or adjust the image quality.

• If an image problem occurs when you use the other paper type, temporarily set the values of the [08] codes [2934] to [2937] (bias offset) and [5293] to [5296] (fusing temperature during printing) back to the default ones. Then perform the adjustment again.

• When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

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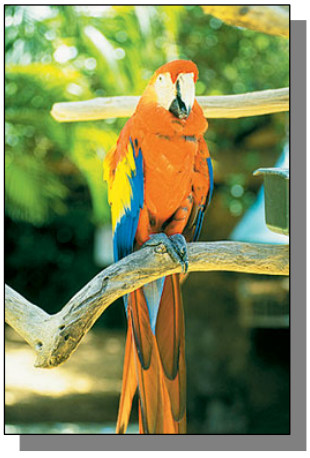
1.4 To Minimize Variations in the Image Quality under the Operating Conditions

(To optimally program image quality control)

Before the adjustment



The image contrast varies, depending on the date and time when copying or printing is performed or the type of job.

After the adjustment

The image quality is constantly maintained.

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❑ Explanation

The image contrast may vary, depending on the date and time when copying or printing is performed or the type of copy/print job. To constantly maintain image quality, shorten the waiting period until image quality control is performed.

❑ Procedures

* The service technician must perform the adjustment in accordance with the procedures below.

(1) Enter setting mode [08]. Change the value for code [566], [570] or [572] to specify the best interval during which image quality control should be performed, according to use of the MFP.

The MFP is installed in a place where the temperature and humidity vary widely:

Set "1" (value × 5%R.H.) for code 08-570 to increase the frequency of image quality control, in response to a change in humidity.

* Image quality control will be performed, when the relative humidity changes in accordance with the specified difference from the previous image quality control. If the difference in the relative humidity exceeds the specified value, image quality control is performed first. Then a copy or print job will be performed.

Value for 08-570	Difference in relative humidity
1	5%R.H.
2	10%R.H. (default)

• After setting the value for code 08-570, forcibly perform image quality control, as follows:
Enter adjustment mode [05]. Select code [396]. Press the [START] button.

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To Have Uniform Variations in the Image Quality after Return from the Auto Power Save Mode:

Change the value of the [08] code [571] to change the conditions for starting image quality control (shorten the period of time the MFP is left unused) after the MFP was recovered from the auto power save mode, so that the image quality control will be easily performed.

* This adjustment will improve the image quality, but only if the sleep mode / auto shut off mode have been disabled ("20" is set for code 08-206). Remember that there will be no positive affect on the image quality, if the sleep mode / auto shut off mode have been enabled.

Value for 08-571	Period of time the MFP is left unused before starting image quality control
0	3 minutes or longer (image quality control is performed before the paused job is resumed)
1	5 minutes or longer (image quality control is performed before the paused job is resumed)
2	10 minutes or longer (image quality control is performed before the paused job is resumed)
3	15 minutes or longer (image quality control is performed before the paused job is resumed)
4	20 minutes or longer (image quality control is performed before the paused job is resumed)
5	30 minutes or longer (image quality control is performed before the paused job is resumed)
6	45 minutes or longer (image quality control is performed before the paused job is resumed)
7	60 minutes or longer (image quality control is performed before the paused job is resumed)
8	90 minutes or longer (image quality control is performed before the paused job is resumed)
9	120 minutes or longer (default value - image quality control is performed before the paused job is resumed)

• After setting the value for code 08-571, forcibly perform image quality control, as follows:
Enter adjustment mode [05]. Select code [396]. Press the [START] button.

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A large number of sheets are printed (hundreds of copies or more per day) and the image quality needs to be constantly maintained:

Set the value for code 08-572 within a range of "1" to "9" (Value × 100 sheets) to reduce the accumulated number of printed sheets. It will determine the interval until the next image quality control is performed.

* After a copy or print job is completed, if the accumulated number of printed sheets exceeds the specified value, image quality control will be performed.

Value for 08-572	Accumulated number of printed sheets before image quality control is performed
1 to 9	100 to 900 sheets
10	1,000 sheets (default)

• After setting the value for code 08-572, forcibly perform image quality control, as follows:
Enter adjustment mode [05]. Select code [396]. Press the [START] button.

After performing the adjustment, print and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) The image density or color during continuous printing on the plain paper can be stabilized by changing the fusing related settings by means of the following procedures.

❑ Procedures

Follow the procedure below.

(a) Change the parameter of 08-5241-0 (Temperature correction in ready status, heat roller at normal temperatures) to "0" (default: "2" (0 deg. C)) and reduce the set temperature by 10 deg. C.

(b) Change the parameter of 08-5241-1 (Temperature correction in ready status, pressure roller at normal temperatures) to "0" (default: "2" (0 deg. C)) and reduce the set temperature by 10 deg C.

(c) Change the parameter of 08-5308-1 (Pre-running time for the first printing, plain paper at normal temperatures, color) to "9" (default: "0" (Invalid) and extend the pre-running time for the first printing by 10 sec.

(d) Change the parameter of 08-5310-1 (Applicable period of pre-running time for the first printing) to "0" (default: "8" (10 min.) and change the setting of "Pre-running for the first printing" to "Always use".

* "Pre-running for the first printing" means the idling rotation of the Fuser Unit prior to printing.

<Notes>

• Confirm if the firmware version is the latest one before the setting. If not, update it to the latest one.
• After these settings, the machine may go into the “wait” status since the fusing temperature can not follow depending on the usage conditions, such as low temperature, thick paper, just recovering after warming up, etc.
• After these settings, the fusing performance may degrade depending on the usage conditions, such as low temperature, thick paper, just recovering after warming up, etc. In such a case, return the setting to default.
• These settings extend the First Print Out Time by the period of time required for pre-running of the first printing.
• These settings always perform the pre-running for the first printing of each job by the time required for pre-running of the first print. This results in reducing the life of consumables.

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(3) Use the thick paper mode when you print on plain paper.

• If the thick paper mode is used, printing decelerates but image quality becomes more stable because differences in color or temperatures during continuous printing will be reduced.

• Set the thick paper mode following steps (a) to (i) below.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the “User Functions” menu.

(b) Press the [USER] tab.

(c) Press [DRAWER] in the USER menu.

(d) Select a drawer that you want to set for thick paper mode and paper size.

(e) Press [PAPER TYPE].

(f) Press [THICK 1].

(g) Enter the adjustment mode [05]. Then select the subcode “1” for the code [2934] and change the setting value to “3”.

• Change the level of transfer roller bias offset in the color mode, the front side of paper.

* Check how the copy image changes carefully. The setting value may be changed to “4” or “2” if required.

(h) Place paper to be used on the drawer that you selected in step (d) above.

(i) Perform automatic calibration.

* Refer to step (2) in “1.1 To Obtain a Darker Image”.

After setting the value, print and check the image quality.

If further image quality adjustment is necessary, go to the next step.

(4) Check the life of the consumables (particularly the drum, developer material and transfer belt unit) and replace them, if necessary.

• When replacing any consumable, use steps (a) to (c).

(a) Enter the PM support mode. Reset the counter corresponding to the replaced consumable to "0."

* For further information regarding the PM support mode, refer to the Service Handbook.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be performed and the image quality control value will be initialized.

(c) Perform automatic calibration.

* For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

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❑ Precautions after the completion of the adjustment

• The adjustment may possibly slow down the copying or printing speed, extend the warm-up time when the MFP is returned from the auto power save mode, and shorten the life of the consumables, because of an increase in the number of times image quality control is performed. Therefore, carefully perform the adjustment, while checking the copy or print image.

• Note the following when you print in thick paper mode in step (3):

- Printing speed decelerates to 17.5 sheets per minute (A4/LT) after the adjustment.
- The thick paper mode cannot be set for the LCF (Large Capacity Feeder, optional). Therefore the maximum number of sheets acceptable for continuous printing should be the one for the drawer. However in the copying mode, you can set the thick paper mode to more than one drawer and copy more paper continuously with the automatic drawer change function.
- The density level of the halftone image may differ from that of the plain paper mode after the adjustment.
- The PM counter value increases by 2 counts for 1 sheet of thick paper.

❑ Remarks

• Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in MFP performance, including slowdown in the copying or printing speed.

• When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

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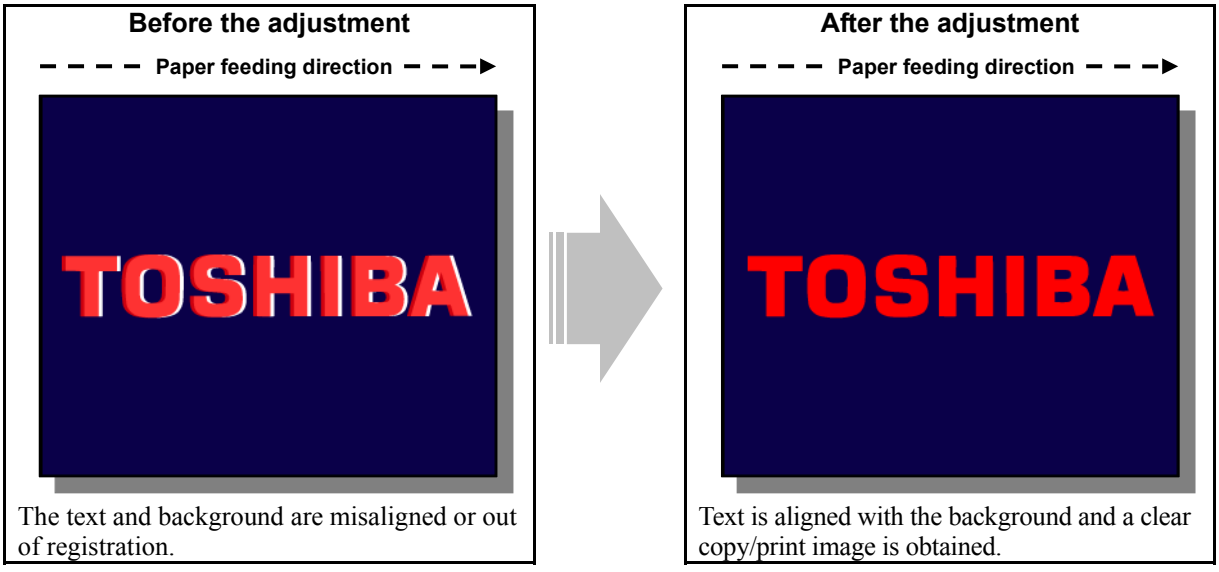
1.5 To Correct Out-of-Registration Colors


Before the adjustment
Paper feeding direction
TOSHIBA
The text and background are misaligned or out of registration.
After the adjustment
Paper feeding direction
TOSHIBA
Text is aligned with the background and a clear copy/print image is obtained.

❑ Explanation

Colors of text or a thin line are sometimes printed out of alignment. Perform color registration control, in order to print or copy without out-of-registration colors.

❑ Procedures

* The service technician must perform the adjustment in accordance with the procedure below.

(1) Make sure that no out-of-registration colors are visible on an original.

(2) Check the direction in which colors are misaligned.

* This adjustment is intended to correct misaligned colors due to differences between the paper feeding speed and rotating speed of the transfer belt. Therefore, it will be effective, only if colors are misaligned in the paper feeding direction (or the secondary scanning direction). This adjustment cannot improve misaligned colors in the direction perpendicular to paper feeding (or primary scanning) or in the secondary scanning direction periodically (partially at regular intervals). Refer to "Troubleshooting for the Image 1) Color deviation" in the Service Manual.

(3) Enter adjustment mode [05] and print out the test print pattern to correct out-of-registration colors.

(a) Enter adjustment mode [05]. Select code [4719]. Press the [START] button.

• Registration control will be forcibly performed.

(b) Enter code [104] corresponding to a desired test print pattern. Press the [FAX] button.

• Paper is fed from the drawer to print out a test print pattern.

Code	Test print pattern	Paper size	No. of copies
104	Test print pattern for identifying out-of-registration colors	A3/LD	2

* Jot down the "paper feeding direction" on the printed test print pattern beforehand. This facilitates identifying out-of-registration colors in the subsequent adjustment. Use only the second page of the test print pattern.

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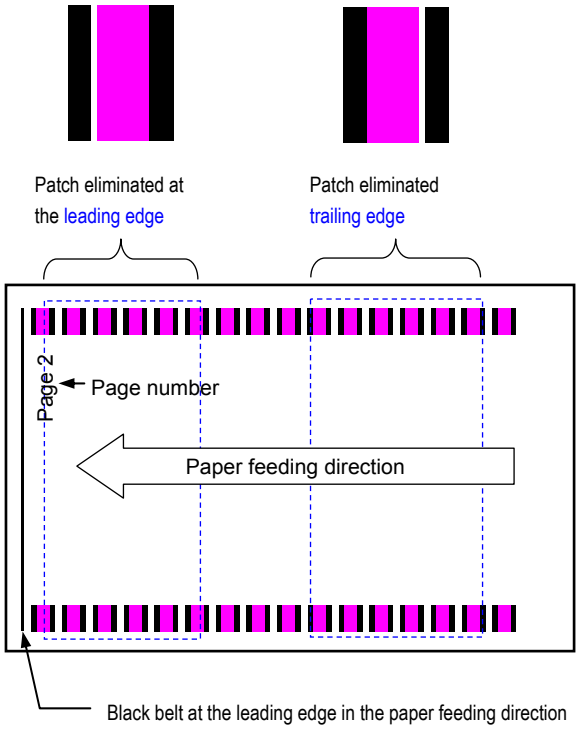
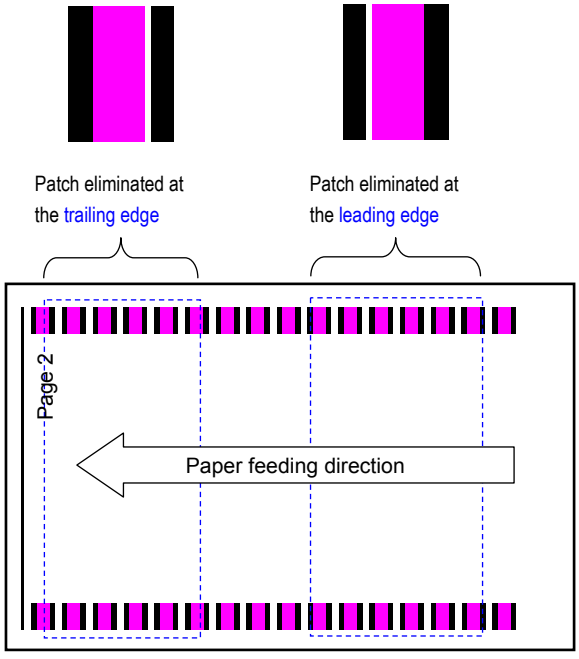
(4) Check the second page of the printed test print pattern to identify a pattern for the out-of-registration colors.
* There are 2 patterns for the out-of-registration colors. Check which pattern the out-of-registration colors to adjust on the body are included.

Pattern A for out-of-registration colors


Patch eliminated at the leading edge
Patch eliminated trailing edge
Page 2
Page number
Paper feeding direction
Black belt at the leading edge in the paper feeding direction

Paper feeding speed **slower than** transfer belt rotating speed

Pattern B for out-of-registration colors



Paper feeding speed **faster than** transfer belt rotating speed

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(5) Finely adjust the rotating speed of the registration motor, in accordance with a pattern for the out-of-registration colors.

• Use steps (a) to (b) to perform the adjustment.

(a) Enter adjustment mode [05]. Select code [483]. Finely adjust the rotating speed of the registration motor.

• Adjust the values in accordance with a pattern for the out-of-registration colors as shown in the table below.

Pattern for out-of-registration colors	[05] code	Subcode	Recommended value	Acceptable value range	Default
Pattern A	05-483	0	123 to 127 (Set a value smaller than 128)	0 to 255	128
Pattern B			129 to 132 (Set a value larger than 128)		

(b) After performing registration control, print out the test print pattern to check whether the misaligned colors have been improved.

* For further information regarding the adjustment procedures, refer to procedures (3) and (4).

* Repeatedly use procedures (3) to (5) as necessary, to select a proper value.

<Hint> When subcode "0" is adjusted for code 05-483, the correlation between the paper feeding speed and rotating speed of the transfer belt will be corrected in every paper mode. However, when colors are misaligned on an image printed in the thick paper mode after the adjustment for subcode "0", adjust subcode "3" (during deceleration in the thick paper mode).

* For subcode "3," use the steps and recommended values for subcode "0."
* Paper for printing a test print pattern will only be fed from the drawer. Load the desired number of sheets of thick paper in the drawer, in order to print the test print pattern on thick paper.
* Adjust subcode "0" and then subcode "3," in order to adjust only misaligned colors in the thick paper mode.

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❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

• Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

•Out-of-registration colors cannot always be perfectly corrected; this depends on the type of text or lines to print.

• Also, refer to the relevant information in the Service Manual for further information regarding color registration control procedures.

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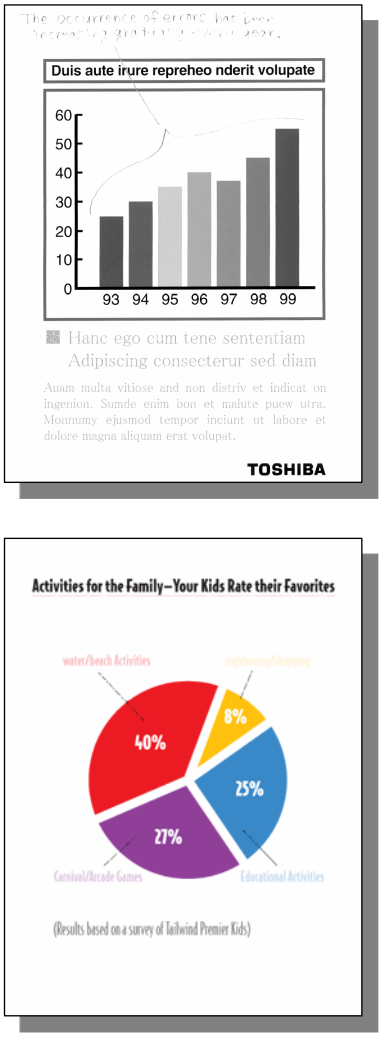
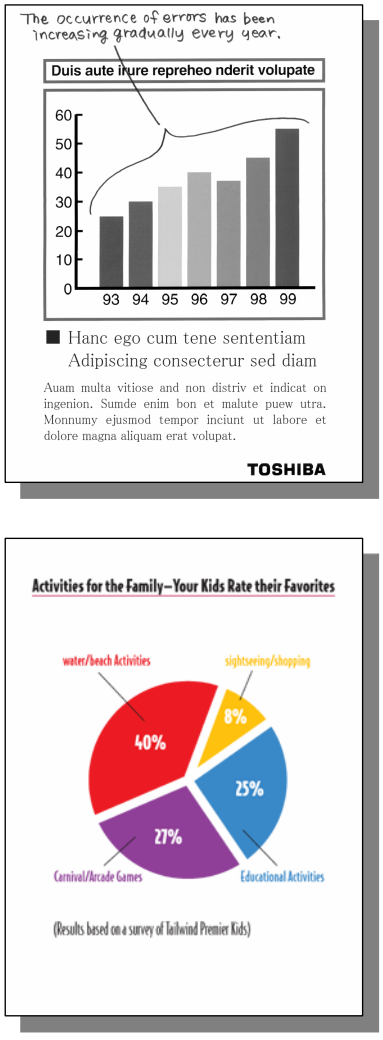
2.1 To Copy Text Clearly (To eliminate faint, smudged or blurred text)

Before the adjustment



When a light print image is copied, the text looks blurred.

After the adjustment


The occurrence of errors has been increasing gradually every year.
Duis aute irure repreheo nderit volupate
60
50
40
30
20
10
0
93 94 95 96 97 98 99
Hanc ego cum tene sententiam
Adipiscing consecterur sed diam
Auam multa vitiose and non distriv et indicat on ingenion. Sumde enim bon et malute puew utra. Monnumy ejusmod tempor inciunt ut labore et dolore magna aliquam erat volupat.
TOSHIBA
Activities for the Family–Your Kids Rate their Favorites
water/beach Activities
sightseeing/shopping
40%
8%
25%
27%
Carnival/Arcade Games
Educational Activities
(Results based on a survey of Tailwind Premier Kids)

The graphic image and text look darker and sharper.

❑ Explanation

Perform image processing, in order to obtain a sharp and dark copy image when copying an original containing light text and graphic images, or a light copy image when copying an original containing a highly colored text and copy image.

❑ Procedures

* The procedure to use varies, depending on whether to adjust the copy image quality in the Black mode, Full color mode or Auto color mode. Refer to the procedure corresponding to the particular user's request.

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2.1.1 To Adjust the Copy Image Quality in the Black Mode

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1), (2) and (4).
* Only the service technician must use procedures (3), (5) and (6).

(1) Press the [BASIC] button on the Control Panel. Press the [◗] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.
With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

(2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.
With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the following procedures.

(3) Enter adjustment mode [05]. Increase the values for codes [604] to [606], [1757] and [7807] to [7809] to make the copied text darker (sharpness level increases).
• The code to use varies according to the original mode (Text/Photo, Text or Photo). Adjust the value for [05] code corresponding to the original mode in which you would like to improve the image quality and set values larger than "128" for codes 05-604/605.

Original mode	[05] code	Recommended value	Acceptable value range	Default
Text / Photo	05-604	Set a value larger than 128.	0 to 255	128
Text	05-605			
Photo	05-606			
Image smoothing	05-7809			
ACS / Black Text/Photo	05-1757			
ACS / Black Text	05-7807			
ACS / Black Photo	05-7808			

* Setting "0" provides the softest image, while setting "255" provides the sharpest image.
Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 25. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 25 (sharper), the value of each step of the indicator will also be increased by 25 (sharper).)

After increasing the sharpness intensity, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(4) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.

* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After selecting the Text mode, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(5) Enter adjustment mode [05]. Decrease the values for codes [648], [649], [925], [7102] and [7103] to make the text darker (improving faint text or thin lines).

Original mode	[05] code	Recommended value	Acceptable value range	Default
Text / Photo	05-648	Set a value smaller than 2.	0 to 4	2
Text	05-649			
User custom	05-925			
ACS / Black Text/Photo	05-7102			
ACS / Black Text	05-7103			

* Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained.

After increasing the copy density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(6) Enter adjustment mode [05]. Change the values for codes [590] to [592] and [7956] to [7959] to adjust the gamma balance in each of medium- and high-density areas.

Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Text / Photo	05-590	1/2	Set a value larger than 128.	0 to 255	128
Text	05-591				
Photo	05-592				
Image smoothing	05-7956				
ACS / Black Text/Photo	05-7957				
ACS / Black Text	05-7958				
ACS / Black Photo	05-7959				

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.
(Please be careful because the gradation (or density) of the medium-density area may exceed that of the high-density area, depending on the set value.)

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* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The density of light text or a graphic image will vary, if the medium- or high-density area is mainly adjusted. Setting "0" for the subcode allows you to adjust the low-density area. But it will not affect the light text or graphic images. Therefore, never change the value for the low-density area.

Subcode	Area where the density is adjusted
1	Medium-density area
2	High-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproducibility of halftones). Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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2.1.2 To Adjust the Copy Image Quality in the Full Color Mode

* The setting value for the Full color mode shall be applied also when the original is judged as the full color image in the Auto color mode.
* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1), (2) and (5).
* Only the service technician must use procedures (3) and (4).

(1) Press the [BASIC] button on the Control Panel. Press the [◗] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.
With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

(2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.
With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the following procedures.

(3) Enter adjustment mode [05]. Increase the values for codes [1737 to 1741] to strengthen the copy density of text (or increase the sharpness intensity).

• The code to use varies according to the original mode (Text/Photo, Text, Printed image, Photo or Map). Adjust the value for [05] code corresponding to the original mode in which you would like to improve the image quality and set values larger than "128" for codes 05-1737 to 1741.

Original mode	[05] code	Recommended value	Acceptable value range	Default
Text/Photo	05-1737	Set a value larger than 128.	0 to 255	128
Text	05-1738			
Printed image	05-1739			
Photo	05-1740			
Map	05-1741			

* Setting "0" provides the softest image, while setting "255" provides the sharpest image.
Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 25. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 25 (sharper), the value of each step of the indicator will also be increased by 25 (sharper).)

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* The values adjusted for the sharpness intensity are shared in the Full color mode with the Printed image mode selected and in the Black mode with the Photo mode selected. Therefore, adjusting the copy image quality in either of the modes affects that in the other mode. Perform copy image quality adjustment in the mode that is used for the adjustment, while checking the one in the other mode.

After increasing the sharpness intensity, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Enter adjustment mode [05]. Change the values for codes [1630 to 1633] to adjust the maximum color density of the text.

Color to adjust	[05] code	Recommended value	Acceptable value range	Default
Y (Yellow)	05-1630	Set a value larger than 5 to increase the density. Set a value smaller than 5 to decrease the density.	0 to 10	5
M (Magenta)	05-1631			
C (Cyan)	05-1632			
K (Black)	05-1633			

* Set the value in increments of 1, while checking the copy image until the optimum value is obtained.

* This adjustment will be effective, only if the "TEXT/PHOTO" or "TEXT" mode is selected from among the original mode options. If the "TEXT/PHOTO" mode is selected, the adjustment will affect only text (or an area which is recognized as text).

After adjusting the maximum color density of the text, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(5) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.
* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproducibility of halftones), and noise around the text on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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2.1.3 To Adjust the Copy Image Quality in the Auto Color Mode

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (2).
* Only the service technician must use procedure (3) and (4).

(1) Press the [BASIC] button on the Control Panel. Press the [◗] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.
With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

(2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.
With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the following procedure.

(3) Enter adjustment mode [05]. Increase the values for codes [1737], [1738], [1757] and [7807] to make the copied text darker (the sharpness level increases).
• In the adjustment mode [05], original modes that allow the adjustment of the sharpness level for the Auto Color mode is only the “TEXT/PHOTO” mode and the “TEXT” mode. Set a value larger than “128” for each code.

Original mode	[05] code	Recommended value	Acceptable value range	Default
Text / Photo	05-1737	Set a value larger than 128.	0 to 255	128
Text	05-1738			
ACS / Black Text/Photo	05-1757			
ACS / Black Text	05-7807			

* Setting "0" provides the softest image, while setting "255" provides the sharpest image.
Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 25. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 25 (sharper), the value of each step of the indicator will also be increased by 25 (sharper).)

* The adjustment value for color mode will be adopted if the original is judged as color with the ACS function.

After setting the value, copy and check the image quality.
If further image quality adjustment is necessary, go to the next step.

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(4) Enter the adjustment mode [05] and adjust the gamma balance in each of medium- and high-density areas.

Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Text/Photo	05-590	1/2	Set a value larger than 128.	0 to 255	128
Text	05-591				
Photo	05-592				
ACS / Black Text/Photo	05-7957				
ACS / Black Text	05-7958				
ACS / Black Photo	05-7959				

Subcode	Area where the density is adjusted
1	Medium-density area
2	High-density area

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained. Note that gradations (density level) in the medium- and high-density areas may be reversed with some setting values.

* Subcodes to be entered differ depending on the target density area. Refer to the table above to enter the subcode for the area to be adjusted. The density of thin text or illustrations is changed by adjusting mainly the setting value for the medium- or high-density area. Do not change the setting value for the low-density area because if the subcode is set at “0”, the density of the low-density area is adjusted but there is little or no effect on changing the density of thin text or illustrations.

After setting the value, copy and check the image quality.

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❑ Precautions after the completion of the adjustment

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproducibility of halftones). Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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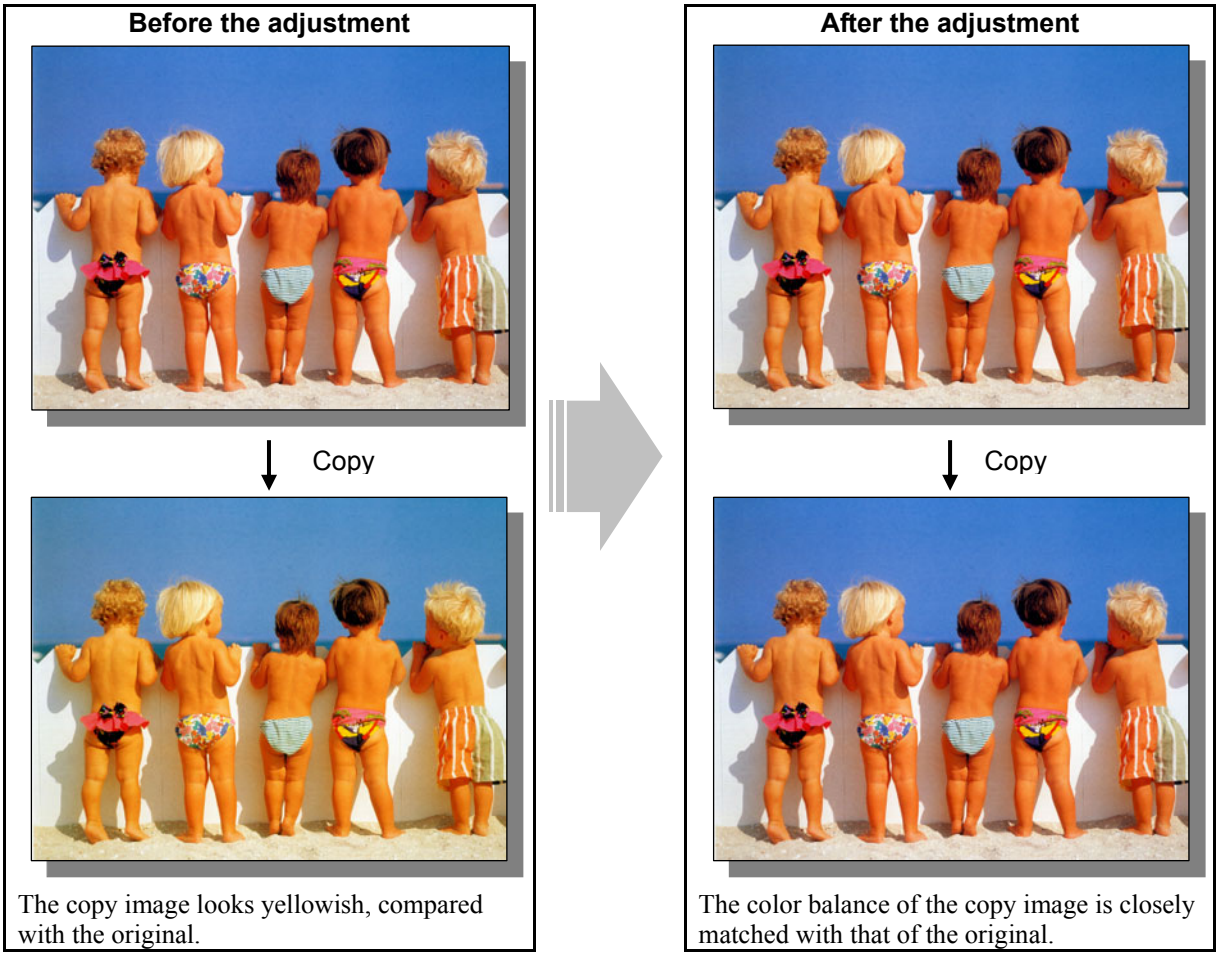
2.2 To Closely Match the Color Balance of the Original


Before the adjustment
Copy
The copy image looks yellowish, compared with the original.
After the adjustment
Copy
The color balance of the copy image is closely matched with that of the original.

❑ Explanation

Depending on the color balance of the original, the copy image sometimes looks different from the original. Perform image quality control, automatic calibration, color adjustment (color balance adjustment or RGB adjustment) and the color density adjustment, in order to match the color balance of the copy image with that of the original.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Only the service technician must use procedures (1) and (5).
* Both the service technician and the user can use procedures (2) to (4).
*Procedure (3) "Hue adjustment" cannot be selected concurrently with procedure (4) "Color balance/RGB adjustments." Performing either of the adjustments and then another adjustment clears what has been previously adjusted. For example, using procedure (3) and then procedure (4) clears the adjusted hue using procedure (3).

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(1) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be forcibly performed to correct the color balance and copy density.

After exercising image quality control, use procedure (2).

(2) Perform automatic calibration to correct variations in the copy density.

* [ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

• Use steps (a) through (i) to perform automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [ADMIN] tab.
(c) Enter an administrator password of 6 to 10 digits. Press the [ENTER] button.
(d) Press the [GENERAL] button.
(e) Press the [CALIBRATION] button.
(f) Press the [COPY] button.
(g) Press the [CALIBRATION] button to print out the test chart.
(h) Place the printed test chart on the original glass.
(i) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.

* As a result of the above steps, the copy image quality will be corrected in the Full color mode and the Black and White mode simultaneously.

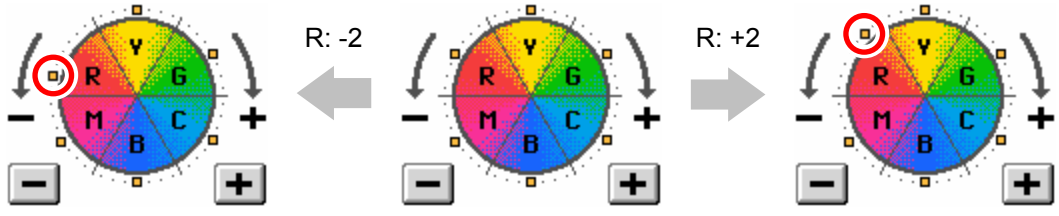
After performing automatic calibration, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Perform hue adjustment to adjust the tint of the color in the color area to change.

• Use steps (a) through (d) to perform the adjustment.

(a) Press the [IMAGE] button on the Control Panel.
(b) Press [HUE] button.
(c) Press the [+] or [-] button on the indicator of the color to adjust.

* Pressing the [+] or [-] button on the indicator changes the hue as shown below.
(For instance, press the [+] button at R (Red). Then the tint of R (Red) is closely matched with that of Y (Yellow).
Press the [-] button at R (Red). Then the tint of R (Red) will be closely matched with that of M (Magenta).



(d) Enter the [ENTER] button.

After adjusting the hue, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(4) Perform color balance adjustment or RGB adjustment to adjust the tint of colors in general.

• Use steps (a) through (d) to perform the adjustment.

(a) Press the [IMAGE] button on the Control Panel.

(b) Press the [COLOR BALANCE] button to adjust the color balance by changing the amount of toner (C, M, Y and K) or the [RGB ADJUSTMENT] button to adjust the color balance by changing the intensity of R, G and B.

(c) Press the [+] button to enhance the tint of the color or the [-] button to decrease it.

* After selecting the color balance by changing the amount of toner (C, M, Y and K), press the [DETAIL] button. The tint of the color can be adjusted according to density area (low-, medium- or high-density area).

(d) Press the [ENTER] button.

After adjusting the tint of the colors, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(5) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

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❑ Precautions after the completion of the adjustment

The adjustment may possibly cause offset failure, particularly when the highly colored original is copied in the Photo mode. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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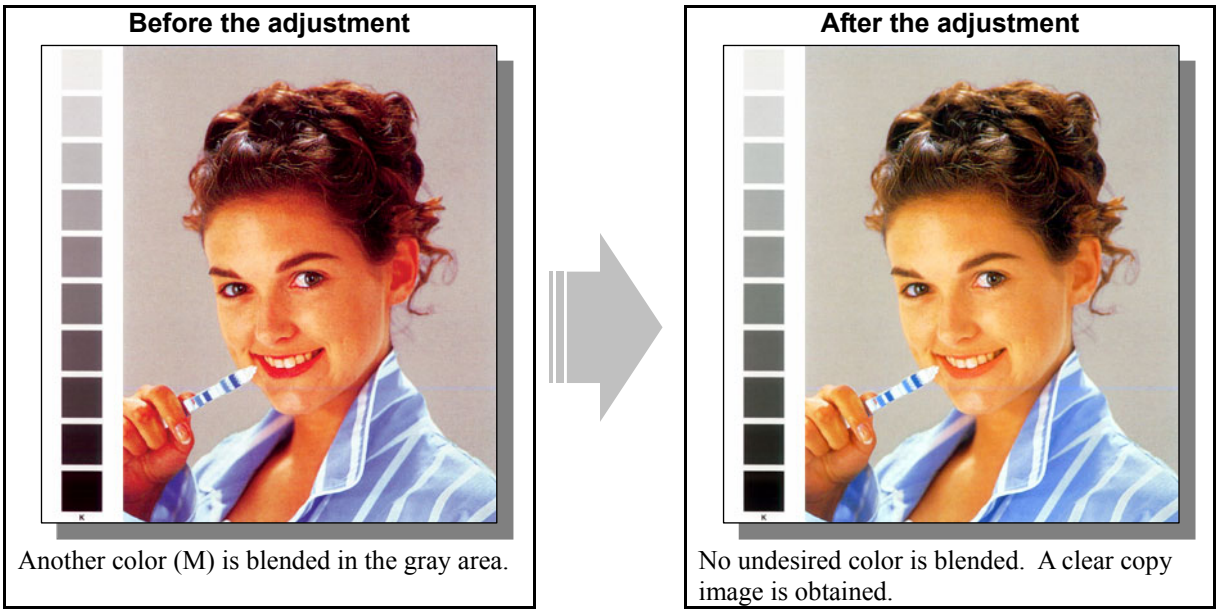
2.3 To Improve the Reproducibility of Gray


Before the adjustment
Another color (M) is blended in the gray area.
After the adjustment
No undesired color is blended. A clear copy image is obtained.

❑ Explanation

When an original containing gray is copied, another color may be blended in the gray area. Perform image quality control, automatic calibration, color adjustment (color balance adjustment or RGB adjustment) and color density adjustment, in order to avoid this problem (or to obtain an achromatic color, for instance).

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Only the service technician must use procedures (1) and (4).
* Both the service technician and the user can use procedures (2) and (3).

(1) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be forcibly performed to correct the color balance and copy density.

After exercising image quality control, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) Perform automatic calibration to correct variations in the copy density.

* For further information regarding the adjustment procedures, refer to procedure (2) in 2.2 To Closely Match the Color Balance of the Original.

* [ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

After performing automatic calibration, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(3) Perform color balance adjustment or RGB adjustment to adjust the tint of colors in general.

* For further information regarding the adjustment procedures, refer to procedure (4) in 2.2 To Closely Match the Color Balance of the Original.

After adjusting the tint of colors, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause offset failure, particularly when a highly colored original is copied in the Photo mode. Also, it may cause degradation in the color reproducibility. (Excessively enhancing the tint of black makes other colors, such as skin tones, look dull.) Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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2.4 To Copy in Vivid Colors

Before the adjustment

When a copy is made without any adjustments, the vividness is insufficient on the copy image.

After the adjustment

The copy image is obtained in vivid colors.

❑ Explanation

When a copy is made without any adjustments, the vividness may be insufficient on the copy image. Perform saturation adjustment, color adjustment (color balance adjustment or RGB adjustment), and color density adjustment, in order to obtain a copy image in vivid colors.

❑ Procedures

* You can start with any of the procedures other than (5). But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) to (3).
* Only the service technician must use procedure (4).
* Only if the vividness of R (Red) is still insufficient even after procedures (1) to (4) have been used, the service technician must use procedure (5).

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(1) Press the [IMAGE] button on the Control Panel. Press the [ONE TOUCH ADJUSTMENT] button.
Press the [VIVID] button.

After selecting the "Vivid" option, copy and check the copy image quality.
When the copy image quality with the "Vivid" option is insufficient, cancel the "Vivid" option and use the next procedure.
(The one-touch adjustment can be canceled by pressing the [ONE TOUCH ADJUSTMENT] button again.)

(2) Perform saturation adjustment to adjust the overall saturation.

• Use steps (a) through (d) to perform the adjustment.

(a) Press the [IMAGE] button on the Control Panel.
(b) Press the [SATURATION] button.
(c) Press the [+] button to increase the saturation of the copy image.
(d) Press the [ENTER] button.

After adjusting the saturation, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Perform color balance adjustment or RGB adjustment to adjust the tint of colors in general.

* For further information regarding the adjustment procedures, refer to procedure (4) in 2.2 To Closely Match the Color Balance of the Original.

After adjusting the tint of colors, copy and check the copy image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure.

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(4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

After setting the values, copy and check the copy image quality.
Only if the vividness of R (Red) is still insufficient even after all the above procedures have been used, must the service technician use the next procedure.

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(5) Enter adjustment mode [05]. Change the value for code [2905] to adjust the transfer (1st transfer) roller bias output.
(Adjust the offset voltage of transfer roller bias for C (Cyan) and K (Black) so as to increase the density of R (Red).)

• The code to use varies according to the paper type and color to adjust. Adjust the value for the subcode corresponding to the color for which you would like to improve the image quality. Set the value within a range of "2" to "5" to obtain the highest density of R (Red).

Paper type	Color to adjust	[05] code	Subcode	Recommended value	Acceptable value range	Default
Plain paper	C (Cyan)	05-2905	2	2 to 5	0 to 10	5
	K (Black)		3			
Thick	C (Cyan)		8			
	K (Black)		9			

*Never change the values for subcodes other than the above. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

<Note>
- The adjustment may possibly decrease the density of G (Green), B (Blue) and K (Black) extremely. Therefore, carefully perform the adjustment, while checking the copy image.
- Unless this adjustment changes the density of R (Red), return the values to the default (set value: 5).
- This adjustment may affect not only the copy image but also every image quality such as the printout. Therefore, perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause offset failure, particularly when the highly colored original is copied in the Photo mode. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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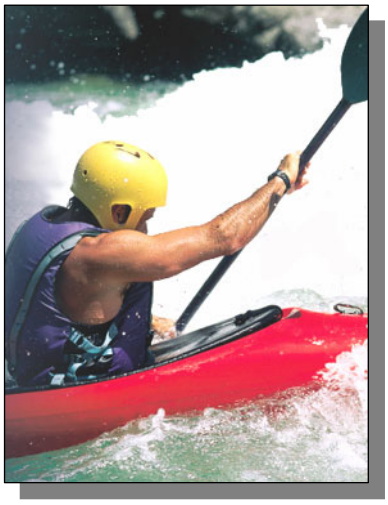
2.5 To Make the Pale Area of the Original Look Darker and Sharper

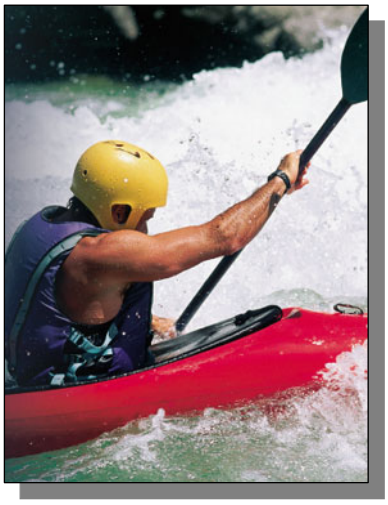
(To improve the highlight reproducibility)

Before the adjustment



The splashing area (highlight) is blurred.

After the adjustment



A clear copy image of the splashing area is obtained.

❑ Explanation

Perform the copy density adjustment and background adjustment, in order to make the pale area (highlight) of the original look darker and sharper on the copy.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (3).
* Only the service technician must use procedures (2) and (4).

(1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [DARK] button to darken the background.

After increasing the background density, copy and check the copy image quality.
With the background density set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

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(2) Enter adjustment mode [05]. Change the values for codes [1688] to [1692], [1698] to [1702] and [7759] to [7761] to adjust the density level of the background.

* The highlighted area will become highly visible, if the background density is increased.

Adjustment	Original mode	[05] code	Recommended value	Acceptable value range	Default
Automatic offsetting adjustment for background processing	Text/Photo	05-1688	Set a value larger than 128 to increase the density.	0 to 255	128
	Text	05-1689			
	Printed image	05-1690			
	Photo	05-1691			
	Map	05-1692			
Manual offsetting adjustment for background processing	Text/Photo	05-1698			
	Text	05-1699			
	Printed image	05-1700			
	Photo	05-1701			
	Map	05-1702			
Twin color copy	Text/Photo	05-7759			
	Text	05-7760			
	Printed image	05-7761			

* The value for automatic offsetting adjustment for background processing will be applied, only if the automatic copy density mode is selected. On the other hand, the value for manual offsetting adjustment for background processing will be applied, only if the manual copy density mode is selected.

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

<Note> "Making the highlighted area more visible (or increasing the background density)" and "eliminating the background color (or decreasing the background density)" are mutually contradictory. If the background color is darkened to make the highlighted area more visible, the hue of the background may change.

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Press the [BASIC] button on the Control Panel. Press the [◗] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.
With the copy density set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

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(4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1			
	Printed image	05-1781	0/1			
	Photo	05-1782	0/1			
	Map	05-1783	0/1			
M (Magenta)	Text/Photo	05-1784	0/1			
	Text	05-1785	0/1			
	Printed image	05-1786	0/1			
	Photo	05-1787	0/1			
	Map	05-1788	0/1			
C (Cyan)	Text/Photo	05-1789	0/1			
	Text	05-1790	0/1			
	Printed image	05-1791	0/1			
	Photo	05-1792	0/1			
	Map	05-1793	0/1			
K (Black)	Text/Photo	05-1794	0/1			
	Text	05-1795	0/1			
	Printed image	05-1796	0/1			
	Photo	05-1797	0/1			
	Map	05-1798	0/1			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The density of the highlighted area will vary, if the low- or medium-density area is mainly adjusted. Setting "2" for subcode allows you to adjust the high-density area. But it will not affect the highlighted area. Therefore, never change the value for the high-density area.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly provide an excessively dark background. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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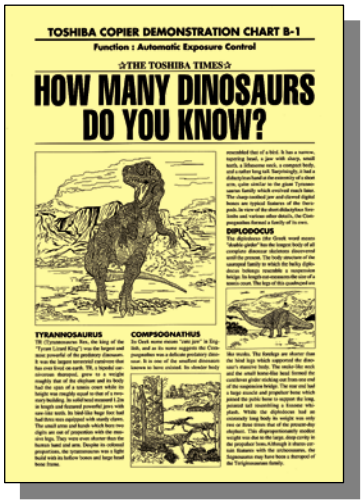
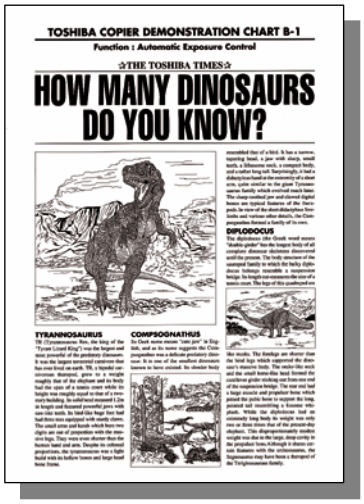
2.6 To Eliminate the Background Color

Before the adjustment



The background color of the original is also copied. Therefore, no clear contrast is made between the background and text.

After the adjustment



The background color is eliminated, allowing clear contrast between the background and text.

❑ Explanation

When a full-color original, such as colored paper, is copied, its background color is also copied. Therefore, no clear contrast is made between the background and the text on the copy. Perform background adjustment, in order to copy an original with a highly colored background, while eliminating the background color or making it white.

❑ Procedures

* The procedure to use varies, depending on whether to adjust the copy image quality in the Black mode or the Full color mode. Refer to the procedure corresponding to the user's particular request.

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2.6.1 To Adjust the Copy Image Quality in the Black Mode

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedure (1).
* Only the service technician must use procedures (2) to (4).

(1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.
With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

(2) Enter adjustment mode [05]. Change the values for codes [7033], [7034], [7041] to [7044], [7048] and [7049] to adjust the density level of the background.

Adjustment	Original mode	[05] code	Recommended value	Acceptable value range	Default
Manual density adjustment	Text/Photo	05-7041	Set a value smaller than 128.	0 to 255	128
	Text	05-7042			
	Photo	05-7048			
	Image smoothing	05-7049			
Manual adjustment	Text/Photo	05-7033			
	Text	05-7034			
	Photo	05-7043			
	Image smoothing	05-7044			

* Set the value in increments of approximately 25, while checking the copy image until the optimum value is obtained.

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Enter adjustment mode [05]. Change the values for codes [590] to [592] to adjust the gamma balance in each of low- and medium-density areas.

Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Text/Photo	05-590	0/1	Set a value smaller than 128.	0 to 255	128
Text	05-591	0/1			
Phont	05-592	0/1			

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.

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* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The background density will vary, if the low- or medium-density area is mainly adjusted. Setting "2" for the subcode allows you to adjust the high-density area. But it will not affect the background density. Therefore, never change the value for the high-density area.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area

After adjusting the gamma curve balance, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Enter the adjustment mode [05]. Change the values for codes [7286] and [7287] to set the range correction operation in the manual density mode fixed.

• The code to be set differs depending on the original mode (Text/Photo or Text). Select the [05] code for the target original mode and change the value to "0".

Original mode	[05] code	Recommended value	Acceptable value range	Default
Text/Photo	05-7286	0	0, 1	1
Text	05-7287			

* Explanation for setting values

Setting value	Range correction operation
0	Fixed
1	Varied

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause text handwritten with a pencil or light text to become illegible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

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2.6.2 To Adjust the Copy Image Quality in the Full Color Mode

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (4).
* Only the service technician must use procedures (2) and (3).

(1) Press the [AUTO] button on the Control Panel to select the automatic density adjustment.

(2) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.
With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

(3) Enter adjustment mode [05]. Change the values for codes [1688 to 1692] and [1698 to 1702] to adjust the background density.

Adjustment	Original mode	[05] code	Recommended value	Acceptable value range	Default
Automatic offsetting adjustment for background processing	Text/Photo	05-1688	Set a value smaller than 128.	0 to 255	128
	Text	05-1689			
	Printed image	05-1690			
	Photo	05-1691			
	Map	05-1692			
Manual offsetting adjustment for background processing	Text/Photo	05-1698			
	Text	05-1699			
	Printed image	05-1700			
	Photo	05-1701			
	Map	05-1702			

* The value for automatic offsetting adjustment for background processing will be applied, only if the automatic copy density mode is selected. On the other hand, the value for manual offsetting adjustment for background processing will be applied, only if the manual copy density mode is selected.

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The value adjusted for the background density is shared in the Full color mode with the Printed image mode selected and in the Black mode with the Photo mode selected. Therefore, adjusting the copy image quality in either of the modes affects that in the other mode. Perform copy image quality adjustment in the mode that is used for the adjustment, while checking that in the other mode.

* In the manual density adjustment, images are processed with the highlighting reproducibility given priority. Therefore it is recommended to select the automatic density adjustment in order to make the background lighter.

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<Note> "Making the highlighted area more visible (or increasing the background density)" and "eliminating the background color (or decreasing the background density)" are mutually contradictory. If the density of the background color is decreased, the highlighted area may become less visible.

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, or background elimination is necessary according to color, use the next procedure.

(4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1			
	Printed image	05-1781	0/1			
	Photo	05-1782	0/1			
	Map	05-1783	0/1			
M (Magenta)	Text/Photo	05-1784	0/1			
	Text	05-1785	0/1			
	Printed image	05-1786	0/1			
	Photo	05-1787	0/1			
	Map	05-1788	0/1			
C (Cyan)	Text/Photo	05-1789	0/1			
	Text	05-1790	0/1			
	Printed image	05-1791	0/1			
	Photo	05-1792	0/1			
	Map	05-1793	0/1			
K (Black)	Text/Photo	05-1794	0/1			
	Text	05-1795	0/1			
	Printed image	05-1796	0/1			
	Photo	05-1797	0/1			
	Map	05-1798	0/1			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The background (highlight) density will vary, if the low- or medium-density area is mainly adjusted. Setting "2" for the subcode allows you to adjust the high-density area. But it will not affect the background density. Therefore, never change the value for the high-density area.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(5) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.

* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause the highlighted area to become less visible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

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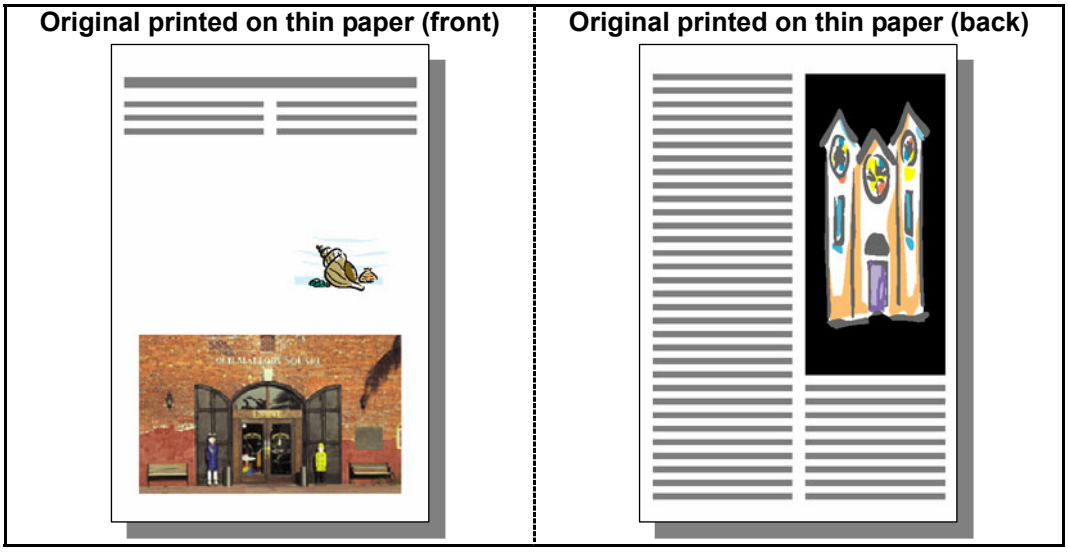
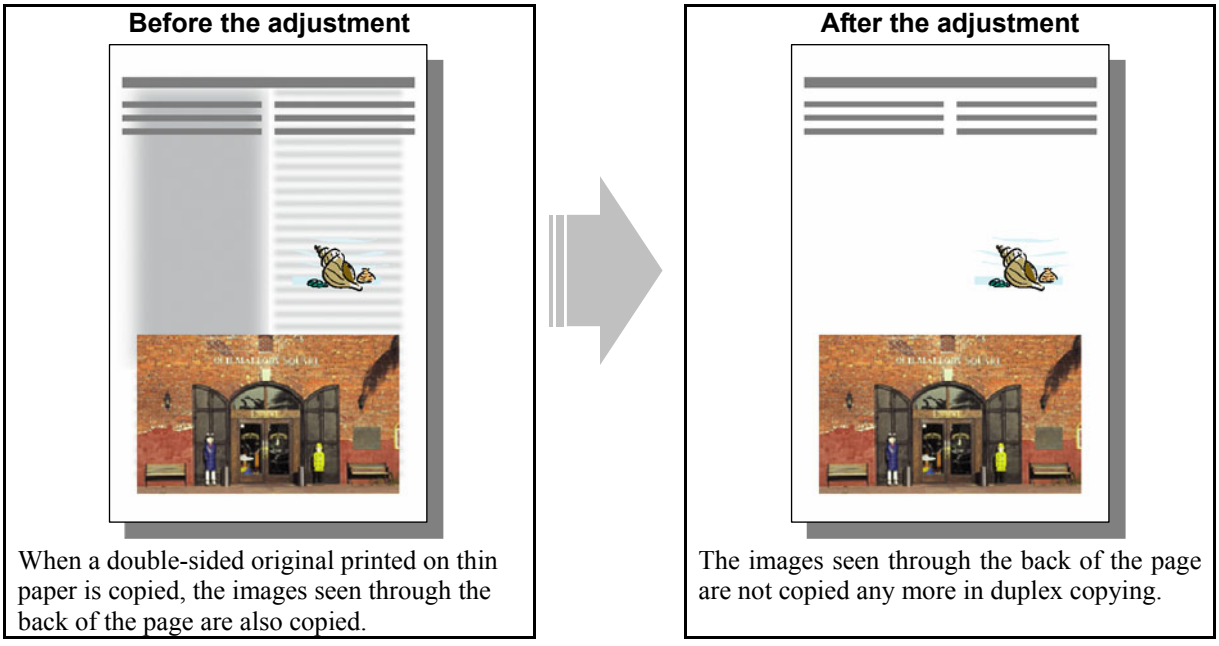
2.7 To Avoid Copying the Image Seen through the Back of a Page Printed on Thin Paper




Before the adjustment
When a double-sided original printed on thin paper is copied, the images seen through the back of the page are also copied.
After the adjustment
The images seen through the back of the page are not copied any more in duplex copying.

❑ Explanation

When a double-sided original printed on thin paper, such as a brochure and leaflet, is copied, the images seen through the back of the page are also copied. Perform background adjustment, in order to avoid this problem.

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❑ Procedures

* The procedure to use varies, depending on whether to adjust the copy image quality in the Black mode or the Full color mode. Refer to the procedure corresponding to the user's particular request.

* Refer to the procedure to adjust the copy image quality in the Full color mode with the Printed image mode selected, in order to adjust the copy image quality in the Black mode with the Photo mode selected. The value adjusted is shared in the Black mode with the Photo mode selected and in the Full color mode with the Printed image mode selected. Therefore, adjusting the copy image quality in either of the modes affects that in the other mode.

2.7.1 To Adjust the Copy Image Quality in the Black Mode

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedure (1) and (2).
* Only the service technician must use procedures (3) to (5).

(1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.
With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

(2) Press the [BASIC] button on the Control Panel. Press the [◁] button to decrease the copy density.
* Move the copy density indicator to the " ◁ " side for 1 or 2 steps. The images seen through the back of the page will no longer be copied. But remember that text will also be lightly copied, depending on the type of original.

After decreasing the copy density, copy and check the copy image quality.
With the copy density set to the minimum, if the images seen through the back of the page are still copied, or if you would like to prevent this problem without changing the copy density of text, use the next procedure.

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(3) Enter adjustment mode [05]. Change the values for codes [7033], [7034], [7041] to [7044], [7048] and [7049] to adjust the density level of the background.

Adjustment	Original mode	[05] code	Recommended value	Acceptable value range	Default
Manual density adjustment	Text/Photo	05-7041	Set a value smaller than 128.	0 to 255	128
	Text	05-7042			
	Photo	05-7048			
	Image smoothing	05-7049			
Manual adjustment	Text/Photo	05-7033			
	Text	05-7034			
	Photo	05-7043			
	Image smoothing	05-7044			

* Set the value in increments of approximately 25, while checking the copy image until the optimum value is obtained.

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Enter the adjustment mode [05]. Change the values for codes [7286] and [7287] to make the range correction operation in the manual density mode fixed.

• The code to be set differs depending on the original mode (Text/Photo or Text). Select the [05] code for the target original mode and change the value to "0".

Original mode	[05] code	Recommended value	Acceptable value range	Default
Text/Photo	05-7286	0	0, 1	1
Text	05-7287			

* Explanation for setting values

Setting value	Range correction operation
0	Fixed
1	Varied

After adjusting the background peak, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(5) Enter adjustment mode [05]. Change the values for codes [590] to [592] to adjust the gamma balance in each of the low- and medium-density area.

Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Text/Photo	05-590	0/1	Set a value smaller than 128.	0 to 255	128
Text	05-591	0/1			
Photo	05-592	0/1			

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained. (Note that gradations (density level) in the medium- and high-density areas may be reversed with some setting values.)

* Since the subcode varies according to the area where the density is adjusted, refer to the table below and set the appropriate subcode. Remember that mainly adjusting the low- or medium-density area will change the copy density of the images seen through the back of the page. Setting "2" for the subcode will allow you to adjust the high-density area. But this will not solve the problem. Therefore, never change the value for the high-density area.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause text handwritten with a pencil or light text to become illegible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables.

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2.7.2 To Adjust the Copy Image Quality in the Full Color Mode

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (3).
* Only the service technician must use procedure (2).

(1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the copy image quality.
With the background density set to the minimum, if the images seen through the back of the page are still copied, the service technician must use the next procedure.

(2) Enter adjustment mode [05]. Change the values for codes [1688 to 1692] and [1698 to 1702] to adjust the background density.

Adjustment	Original mode	[05] code	Recommended value	Acceptable value range	Default
Automatic offsetting adjustment for background processing	Text/Photo	05-1688	Set a value smaller than 128.	0 to 255	128
	Text	05-1689			
	Printed image	05-1690			
	Photo	05-1691			
	Map	05-1692			
Manual offsetting adjustment for background processing	Text/Photo	05-1698			
	Text	05-1699			
	Printed image	05-1700			
	Photo	05-1701			
	Map	05-1702			

* The value for automatic offsetting adjustment for background processing will be applied, only if the automatic copy density mode is selected. On the other hand, the value for manual offsetting adjustment for background processing will be applied, only if the manual copy density mode is selected.

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The value adjusted for the background density is shared in the Full color mode with the Printed image mode selected and in the Black mode with the Photo mode selected. Therefore, adjusting the copy image quality in either of the modes affects that in the other mode. Perform copy image quality adjustment in the mode that is used for the adjustment, while checking that in the other mode.

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<Note> "Making the highlighted area more visible (or increasing the background density)" and "eliminating the background color (or decreasing the background density)" are mutually contradictory. If the density of the background color is decreased, the highlighted area may become less visible.

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.
* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause the highlighted area to become less visible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

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2.8 To Eliminate Moiré

Before the adjustment

Moiré occurs on the photo image.

After the adjustment

Moiré is eliminated and a clear copy image is obtained.

❑ Explanation

When an original containing photo images or gradational images (halftones) is copied, moiré sometimes occurs on the copy. Perform adjustment regarding image processing (sharpness intensity), in order to obtain a clear copy image, while eliminating moiré.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.

* Both the service technician and the user can use procedures (1) and (2).

* Only the service technician must use procedure (3).

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(1) Press the [BASIC] button on the Control Panel and select the original mode option, as follows:

- To copy in the Full color or the Auto color mode: Select the Printed image mode option.
- To copy in the Black mode: Select the Photo mode option.

* To have the above original mode options selected by default, use the following procedures:

To change the default original mode on the Control Panel

Use steps (a) to (d) to change default original mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] tab.

(c) Press the [COPY] button.

(d) In the "ORIGINAL MODE FOR COLOR" or "BLACK" option, press the button corresponding to the desired original mode option.

To change the default original mode in setting mode [08]

Enter setting mode [08]. Change the value for code [550] or [585] to change the original mode option, which is selected by default at power-on.

- In the Black mode

Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Text
2	Photo
3	Image smoothing
4	Custom

- In the Full color mode

Value for 08-585	Default original mode at power-on
0	Text/Photo (default)
1	Text
2	Printed image
3	Photo
4	Map
5	Custom

* Press the [BASIC] button on the Control Panel. Select "Custom" from among the original mode options in the Black or the Full color mode.
If the [CUSTOM] button is not displayed in the original mode option, change the values for the following codes to enable the "Custom" mode option.

In the Black mode: Enter setting mode [08]. Set "1" for code [508].

In the Full color mode: Enter setting mode [08]. Set "1" for code [506].

After changing the default original mode option, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SOFT] button to soften the copy image.

After softening the copy image, copy and check the copy image quality.
If further image quality adjustments is necessary, go to the next step.

(3) Enter adjustment mode [05].Change the values for codes [604] to [606], [922], [1737] to [1741], [1757], [7795] and [7807] to [7809] to adjust the default value for the sharpness intensity.
* Decreasing the sharpness intensity will minimize moiré.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Black	Text / Photo	05-604	Set a value smaller than 128. (28 to 127)	0 to 255	128
	Text	05-605			
	Photo	05-606			
	User custom	05-922			
	Image smoothing	05-7809			
Full color	Text / Photo	05-1737	Set a value smaller than 128. (28 to 127)	0 to 255	128
	Text	05-1738			
	Printed image	05-1739			
	Photo	05-1740			
	Map	05-1741			
	User custom	05-7795			
ACS / Black	Text / Photo	05-1757	Set a value smaller than 128. (28 to 127)	0 to 255	128
	Text	05-7807			
	Photo	05-7808			

*The smaller the value is, the weaker the sharpness intensity becomes. The larger the setting value is, the stronger the sharpness intensity becomes.
Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 25. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is decreased by 25 (softer), the value of each step of the indicator will also be decreased by 25 (softer).)
However, the range of adjustment values that is valid for sharpness level change is from -100 to +100 of the total of the setting value of the adjustment code and that of the indicator. For instance, if the setting value of the adjustment code is “103” (-25 from the default value), the limit of the steps in the soft side of the indicator is “-3”. If the step is set at “-4”, the image quality will not be changed.

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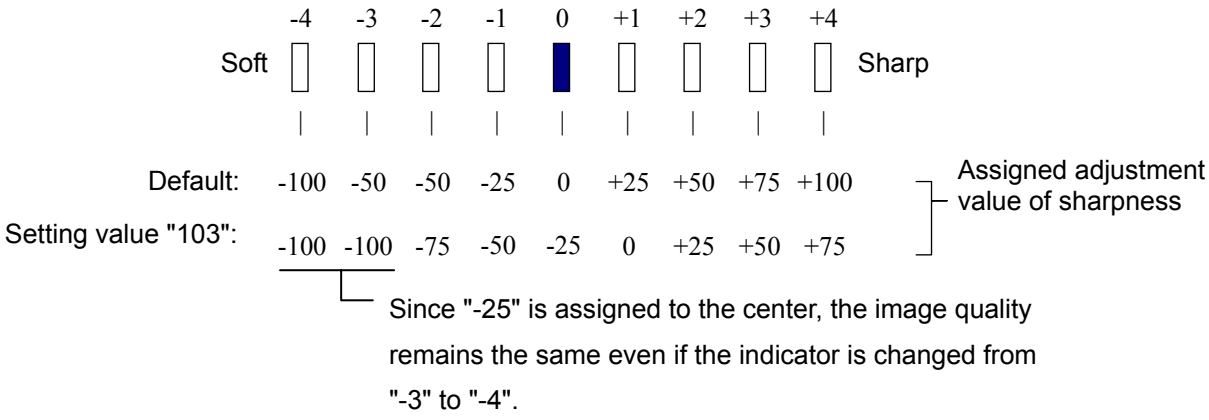
-4 -3 -2 -1 0 +1 +2 +3 +4
Soft
Sharp
Default: -100 -50 -50 -25 0 +25 +50 +75 +100
Assigned adjustment value of sharpness
Setting value "103": -100 -100 -75 -50 -25 0 +25 +50 +75
Since "-25" is assigned to the center, the image quality remains the same even if the indicator is changed from "-3" to "-4".

<Note> "Minimizing moiré" and "Sharpening the copy image" are mutually contradictory. When the adjustment is performed to minimize moiré, the resolution of the copy image may decrease.

❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

• Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

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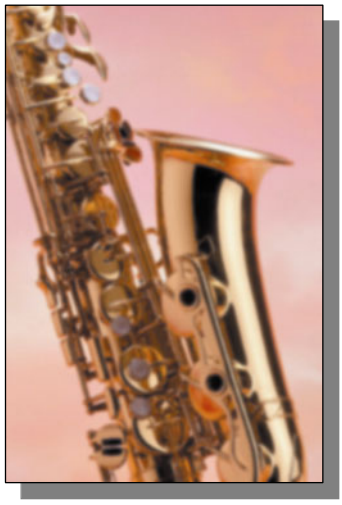
2.9 To Copy Sharply (To enhance sharpness)

Before the adjustment



The image looks light and blurred on the copy.

After the adjustment

The edges are enhanced and the copy image becomes sharper.

❑ Explanation

Perform adjustment regarding image processing (sharpness intensity), in order to obtain a sharper copy image, when a light or blurred original is copied.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (2).
* Only the service technician must use procedure (3).

(1) Press the [IMAGE] button on the Control Panel. Press the [ONE TOUCH ADJUSTMENT] button.
Press the [CLEAR] button.

After selecting the "Clear" option, copy and check the copy image quality.
When the copy image quality with the "Clear" option selected is insufficient, cancel the "Clear" option and use the next procedure.
(The one-touch adjustment can be canceled by pressing the [ONE TOUCH ADJUSTMENT] button again.)

(2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.
If further image quality adjustment is necessary, go to the next step.

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(3) Enter adjustment mode [05]. Change the values for codes [604] to [606], [922], [1737] to [1741], [1757], [7795] and [7807] to [7809] to adjust the default value for the sharpness intensity.

* Increasing the sharpness intensity will enhance the edges of the image.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Black	Text / Photo	05-604	Set a value larger than 128. (129 to 228)	0 to 255	128
	Text	05-605			
	Photo	05-606			
	User custom	05-922			
	Image smoothing	05-7809			
Full color	Text / Photo	05-1737	Set a value larger than 128. (129 to 228)	0 to 255	128
	Text	05-1738			
	Printed image	05-1739			
	Photo	05-1740			
	Map	05-1741			
	User custom	05-7795			
ACS / Black	Text / Photo	05-1757	Set a value larger than 128. (129 to 228)	0 to 255	128
	Text	05-7807			
	Photo	05-7808			

* The smaller the setting value is, the weaker the sharpness intensity becomes. The larger the setting value is, the stronger the sharpness intensity becomes.

Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 25. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 25 (sharper), the value of each step of the indicator will also be increased by 25 (sharper).)

However, the range of adjustment values that is valid for sharpness level change is from -100 to +100 of the total of the setting value of the adjustment code and that of the indicator. For instance, if the setting value of the adjustment code is “103” (-25 from the default value), the limit of the steps in the soft side of the indicator is “-3”. If the step is set at “-4”, the image quality will not be changed.

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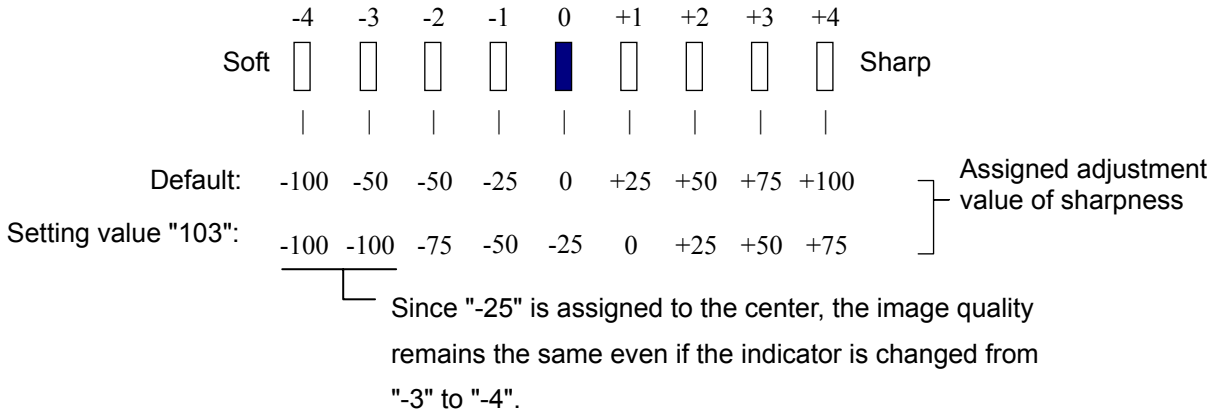
-4 -3 -2 -1 0 +1 +2 +3 +4
Soft
Sharp
Default: -100 -50 -50 -25 0 +25 +50 +75 +100
Setting value "103": -100 -100 -75 -50 -25 0 +25 +50 +75
Assigned adjustment value of sharpness
Since "-25" is assigned to the center, the image quality remains the same even if the indicator is changed from "-3" to "-4".

<Note> "Sharpening the copy image" and "Minimizing moiré" are mutually contradictory. When an adjustment is performed to sharpen the copy image, moiré may occur.

❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

• Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.

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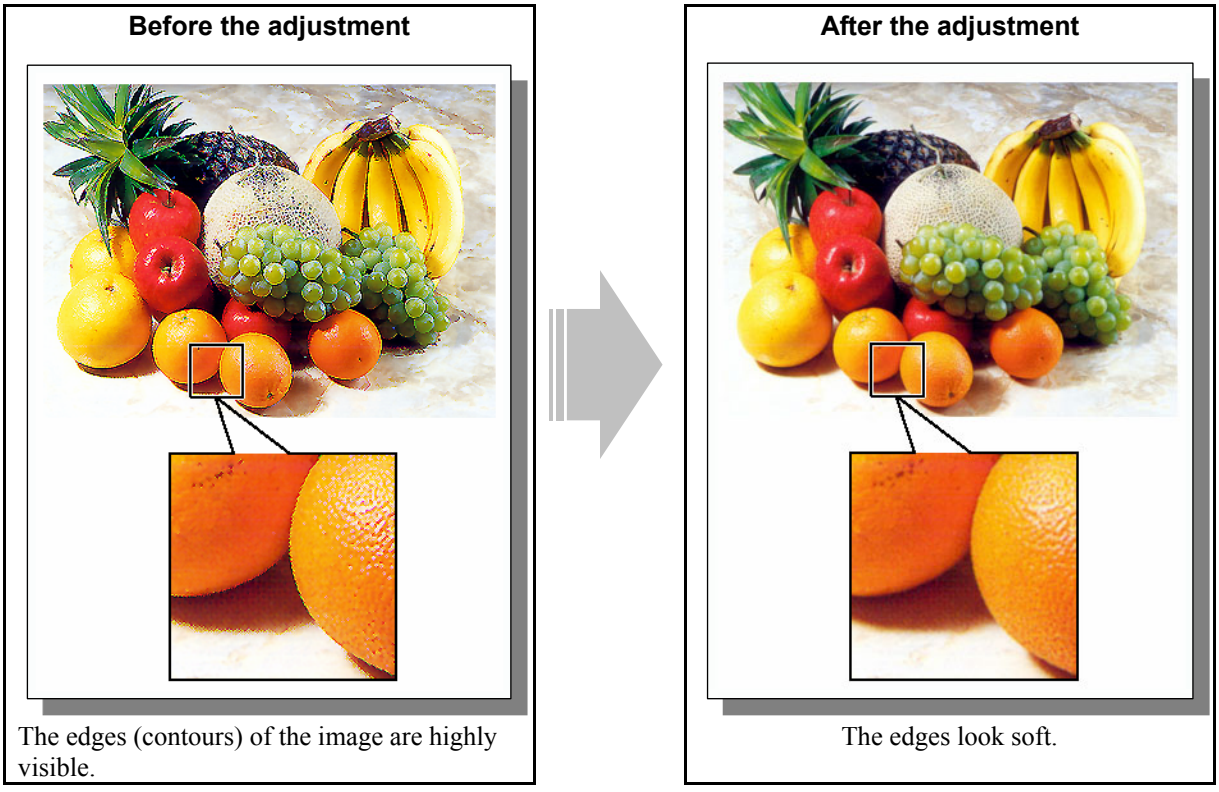
2.10 To Make Photo Edges Look Softer



❑ Explanation

When a photo image is copied, the contours or edges of the image sometimes become highly visible on the copy. Perform adjustment regarding image processing (sharpness intensity), in order to soften the edges of the image.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (2).
* Only the service technician must use procedures (3) to (5).

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(1) Press the [BASIC] button on the Control Panel and select the original mode option, as follows:

- To copy in the Full color or the Auto color mode: Select the Printed image mode option.
- To copy in the Black mode: Select the Photo mode option.

* When copying a photo image in the Full color mode, select the Photo mode option from among the original mode options.

* To have the above original mode options selected by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After changing the default original mode option, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SOFT] button to soften the copy image.

After softening the copy image, copy and check the copy image quality.
If further image quality adjustment is necessary, go to the next step.

(3) Enter adjustment mode [05]. Change the values for codes [604] to [606], [922], [1737] to [1741], [1757], [7795] and [7807] to [7809] to adjust the default value for the sharpness intensity.
* Decreasing the sharpness intensity will minimize the edges of the image.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Black	Text / Photo	05-604	Set a value smaller than 128. (28 to 127)	0 to 255	128
	Text	05-605			
	Photo	05-606			
	User custom	05-922			
	Image smoothing	05-7809			
Full color	Text / Photo	05-1737	Set a value smaller than 128. (28 to 127)	0 to 255	128
	Text	05-1738			
	Printed image	05-1739			
	Photo	05-1740			
	Map	05-1741			
	User custom	05-7795			
ACS / Black	Text / Photo	05-1757	Set a value smaller than 128. (28 to 127)	0 to 255	128
	Text	05-7807			
	Photo	05-7808			

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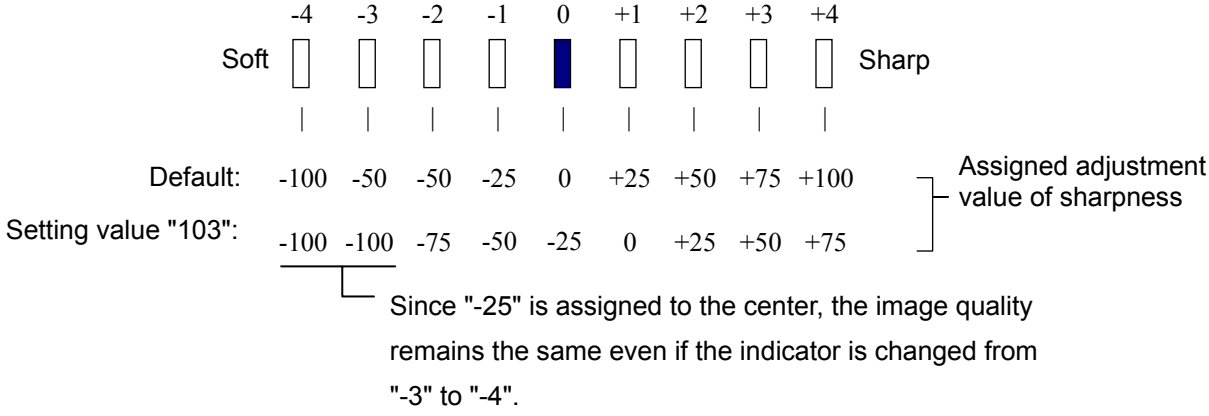
* The smaller the setting value is, the weaker the sharpness intensity becomes. The larger the setting value is, the stronger the sharpness intensity becomes.
Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 25. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is decreased by 25 (softer), the value of each step of the indicator will also be decreased by 25 (softer).)
However, the range of adjustment values that is valid for sharpness level change is from -100 to +100 of the total of the setting value of the adjustment code and that of the indicator. For instance, if the setting value of the adjustment code is “103” (-25 from the default value), the limit of the steps in the soft side of the indicator is “-3”. If the step is set at “-4”, the image quality will not be changed.


-4 -3 -2 -1 0 +1 +2 +3 +4
Soft
Sharp
Default: -100 -50 -50 -25 0 +25 +50 +75 +100
Assigned adjustment value of sharpness
Setting value "103": -100 -100 -75 -50 -25 0 +25 +50 +75
Since "-25" is assigned to the center, the image quality remains the same even if the indicator is changed from "-3" to "-4".

<Note> "Minimizing the edges of the copy image" and "Sharpening the copy image" are mutually contradictory. When the adjustment is performed to minimize the edges, the resolution of the copy image may decrease.

After decreasing the sharpness intensity, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(4) Enter adjustment mode [05]. Change the values for codes [1630 to 1633] to adjust the maximum color density of text.

Color to adjust	[05] code	Recommended value	Acceptable value range	Default
Y (Yellow)	05-1630	Set a value larger than 5 to increase the density. Set a value smaller than 5 to decrease the density.	0 to 10	5
M (Magenta)	05-1631			
C (Cyan)	05-1632			
K (Black)	05-1633			

* Set the value in increment of 1, while checking the copy image until the optimum value is obtained.

After adjusting the maximum color density of the text, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(5) Enter adjustment mode [05]. Change the values for codes [1725] and [7841] to adjust the level of reproducibility in the Text/Photo mode or the User custom mode.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Full color	Text/Photo	05-1725	Set a value smaller than 3.	0 to 5	0
	User custom	05-7841			

* Set the value in increment of 1, while checking the copy image until the optimum value is obtained. First, set "3" for this code and check the copy image. If further image quality improvements are still necessary, set "2." If even further improvements are still necessary, set "1" for this code.

* Remember that if a value larger than "3" is set, the edges of the image are enhanced (attaching importance to the reproducibility of text). The table below shows you the correlation between the value and image quality.

Value	Advantage of image quality	Reproducibility of edges
0	Default	Intermediate
1	Intended to improve the reproducibility of photos more than the one obtained when "2" is set.	Soft
2	Intended to improve the reproducibility of photos more than the one obtained when "3" is set.	↓
3	Equivalent to the one obtained when the default value ("0") is set.	Intermediate
4	Intended to improve the reproducibility of text more than the one obtained when "3" is set.	↓
5	Intended to improve the reproducibility of text more than the one obtained when "4" is set.	Sharp

* For the User custom mode, refer to step (1) in “2.8 To Eliminate Moiré”.

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❑ Precautions after the completion of the adjustment

When an original containing text is copied, the adjustment may possibly cause the text to become blurred on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

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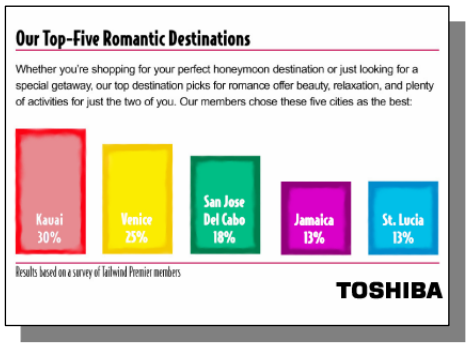
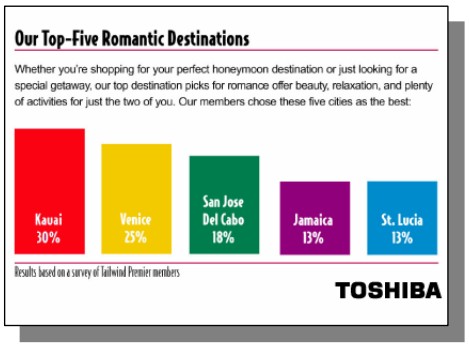
2.11 To Make Solid Filled Bold Text (Logo) Highly Colored

Before the adjustment


Our Top-Five Romantic Destinations
Whether you're shopping for your perfect honeymoon destination or just looking for a special getaway, our top destination picks for romance offer beauty, relaxation, and plenty of activities for just the two of you. Our members chose these five cities as the best:
Kauai 30%
Venice 25%
San Jose Del Cabo 18%
Jamaica 13%
St. Lucia 13%
Results based on a survey of Tailwind Premier members
TOSHIBA

The solid filled graph is not highly colored enough.

After the adjustment


Our Top-Five Romantic Destinations
Whether you're shopping for your perfect honeymoon destination or just looking for a special getaway, our top destination picks for romance offer beauty, relaxation, and plenty of activities for just the two of you. Our members chose these five cities as the best:
Kauai 30%
Venice 25%
San Jose Del Cabo 18%
Jamaica 13%
St. Lucia 13%
Results based on a survey of Tailwind Premier members
TOSHIBA

The solid filled graph becomes highly colored and sharper.

❑ Explanation

Solid filled bold text, such as a logo, is sometimes not highly colored on the copy. Change the original mode option, perform copy density adjustment and level adjustment for black headline text, in order to make the solid filled image more highly colored.

* This adjustment will have an effect only on copying in the Full color mode.

❑ Procedures

* The procedure to use varies, depending on whether to adjust the copy image quality of a black or colored logo. Refer to the procedure corresponding to the user's particular request.

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2.11.1 To Adjust the Copy Image Quality of a Black Logo

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use steps (1) and (2).
* Only the service technician can use steps (3) and (4).

<Important> Before you start this adjustment, make sure that no color misalignment exists on the logos. If there is any, correct it before the adjustment. For how to correct the color misalignment (deviation), refer to "1.5 To Correct Out-of-Registration Colors" in this manual and also the Service Manual.

(1) Press Press the [BASIC] button on the Control Panel. If you want to emphasize the reproducibility of text more, select "TEXT" as an original mode. If you want to emphasize that of photos, select "TEXT/PHOTO".
* If you want the "TEXT" or "TEXT/PHOTO" mode to be the default original mode, refer to step (1) in "2.8 To Eliminate Moiré".

After selecting the Text mode, copy and check the copy image quality.
If further image quality adjustment is necessary, go to the next step.

(2) Perform color balance adjustment to enhance black.
• Use steps (a) through (d) to perform the adjustment.
(a) Press the [IMAGE] button on the Control Panel.
(b) Press the [COLOR BALANCE] button.
(c) Press the [+] button to enhance the tint of [BLACK].
* Press the [DETAIL] button. The tint of the color can be adjusted according to the density area (low-, medium- or high-density area).
(d) Press the [ENTER] button.

After adjusting the tint of black, copy and check the copy image quality.
If further image quality adjustment is necessary even after the tint of black was set to the maximum, the service technician must perform the next step.

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(3) Enter adjustment mode [05]. Change the values for codes [7811], [7812] or [7816] to adjust the black logos.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Full color / Auto color	Text/Photo	05-7811	Set a value larger than 4.	0 to 8	0
	Text	05-7812			
	User custom	05-7816			

* Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained.

* For the User custom mode, refer to step (1) in "2.8 To Eliminate Moiré".

After adjusting the level of black headline text, copy and check the copy image quality.
If further image quality adjustment is necessary, the service technician must perform the next step.

(4) Enter adjustment mode [05]. Change the values for codes [1794], [1795] or [7983] to adjust the density level of the black logos.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
K (Black)	Text/Photo	05-1794	0/1/2	Set a value larger than 128.	0 to 255	128
	Text	05-1795				
	User custom	05-7983				

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause the highly or deeply colored area, such as in a photo, to become blurred on the copy. Also, it may also cause offset failure, grained images and degradation in gradation. Therefore, carefully perform the adjustment, while checking the copy image.

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2.11.2 To Adjust the Copy Image Quality of a Colored Logo

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) to (3).
* Only the service technician must use procedure (4).

(1) Press the [BASIC] button on the Control Panel. Press the [◗] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.
With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

(2) Perform color balance adjustment or RGB adjustment to adjust the tint of the colors in general.

• Use steps (a) through (d) to perform the adjustment.

(a) Press the [IMAGE] button on the Control Panel.
(b) Press the [COLOR BALANCE] button to adjust the color balance by changing the amount of toner
(c) Press the [+] button to enhance the tint of the color or the [-] button to decrease it.
* After selecting the color balance by changing the amount of toner (C, M, Y and K), press the [DETAIL] button. The tint of the color can be adjusted according to density area (low-, medium- or high-density area).
(d) Press the [ENTER] button.

After adjusting the tint of the colors, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.

* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After selecting the Text or Map mode, copy and check the copy image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure.

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(4) Enter adjustment mode [05]. Change the values for codes [1779], [1780], [1784], [1785], [1789], [1790], [1794], [1795] or [7980] to [7983] to adjust the density level of each color.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128.	0 to 255	128
	Text	05-1780	0/1/2			
	User custom	05-7980	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	User custom	05-7981	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790				
	User custom	05-7982	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795				
	User custom	05-7983	0/1/2			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause a dark-colored area, such as in a photo, to become blurred on the copy. Also, it may also cause offset failure, grained images and degradation in gradation. Therefore, carefully perform the adjustment, while checking the copy image.

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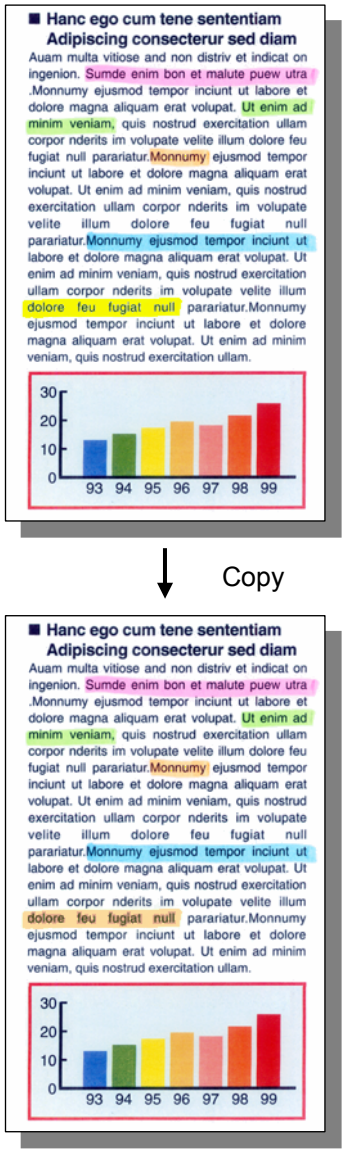
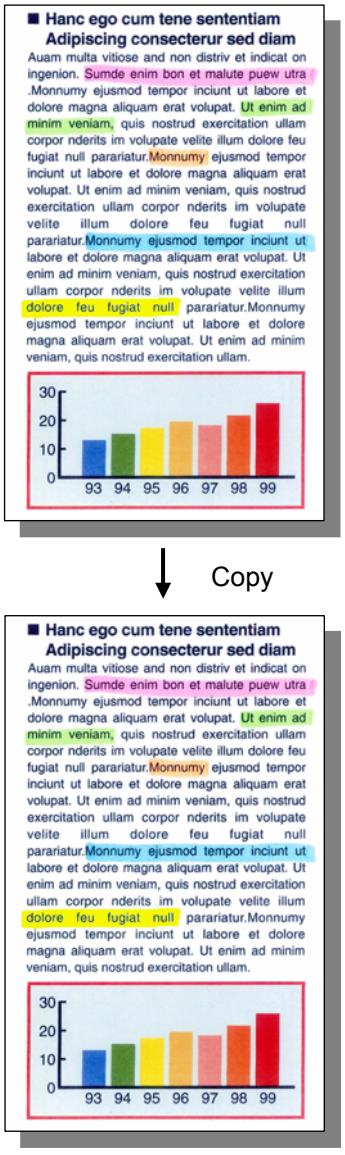
2.12 To Sharply Contrast the Hues of Highlighters on the Copy

Before the adjustment



The hues of highlighters are not accurately reproduced. The areas marked with 2 different colored highlighters are reproduced in the same hue. They are indistinguishable.

After the adjustment



The areas marked with 2 different colored highlighters are accurately reproduced and distinguishable on the copy.

❑ Explanation

When an original containing text or areas marked with highlighters is copied, their hues may sometimes not be accurately reproduced on the copy. The inks of highlighters are special. Therefore, their hues cannot be accurately reproduced. To reproduce the hues of similar highlighters, such as yellow and green, while producing sharp contrasts on the copy, perform color adjustment (color balance adjustment or RGB adjustment) and color density adjustment.

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❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) and (3).
* Only the service technician must use procedures (2) and (4).

(1) Press the [IMAGE] button on the Control Panel. Press the [ONE TOUCH ADJUSTMENT] button. Press the [MARKER] button.

After selecting the "Marker" option, copy and check the copy image quality.
When the copy image quality with the "Marker" option is insufficient, cancel the "Marker" option and use the next procedure.
(The one-touch adjustment can be canceled by pressing the [ONE TOUCH ADJUSTMENT] button again.)

(2) Enter adjustment mode [05]. Change the value for code [1769] to adjust the tint of colors in Marker mode.

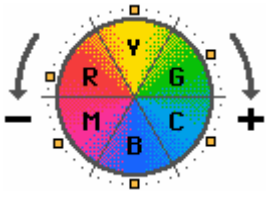
[05] code	Subcode	Acceptable value range	Default
05-1769	0 to 5	0 to 6	3

* Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained.

* The subcode varies according to the color where the adjustment is performed. Refer to the table below and set the subcode for the color to be adjusted.

Subcode	Color to adjust
0	Y (Yellow)
1	M (Magenta)
2	C (Cyan)
3	R (Red)
4	G (Green)
5	B (Blue)

* Setting a value larger than the default value moves the hue of the color selected to [+] as shown below. On the other hand, setting a value smaller than the default value moves it to [-].
(For instance, set 6 for R (Red). Then the tint of the red is closely matched with that of Y (Yellow). Set 0 for R (Red). Then the tint of the red will be closely matched with that of M (Magenta).



After adjusting the hue, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(3) Perform color balance adjustment or RGB adjustment to adjust the tint of the colors in general.
* For further information regarding the adjustment procedures, refer to procedure (4) in 2.2 To Closely Match the Color Balance of the Original.

After adjusting the tint of colors, copy and check the copy image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure.

(4) Enter adjustment mode [05]. Change the values for codes [1779] to [1798] and [7980] to [7983] to adjust the density level of each color.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
	User custom	05-7980	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
	User custom	05-7981	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
	User custom	05-7982	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			
	User custom	05-7983	0/1/2			

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

❑ Precautions after the completion of the adjustment

The adjustment may possibly vary the hues of areas (including photo images and text) other than those marked with highlighters. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

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2.13 To Obtain a Good Color Balance on Thick Paper

Before the adjustment

The copy image looks light on thick paper.

After the adjustment

The copy image looks darker and sharper even on thick paper.

❑ Explanation

When image looks light on paper that is different from usual paper, perform automatic calibration for each paper type to obtain the optimum image quality.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Only the service technician must use procedures (1), (2) and (4).
* Both the service technician and the user can use procedure (3).

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(1) Perform automatic calibration for each paper type to correct variations in image density.

* A privilege to perform automatic calibration is set to Administrator by default but this can be changed to the User. For how to change the privilege, refer to the MFP Management Guide.

• Follow steps (a) through (j) to perform the automatic calibration.

(a) Enter the setting mode [08]. Change the value of the code [9059] to "1" so that automatic calibration for each paper type will be enabled.

Value for 08-9059	Display for user calibration
0	Not displayed (default)
1	Displayed

(b) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(c) Press the [ADMIN] tab.

(d) Enter an administrator password in 6 to 10 digits. Press the [ENTER] button.

(e) Press the [GENERAL] button.

(f) Press the [CALIBRATION] button.

(g) Press the [COPY] button.

(h) Press the [CALIBRATION] button to print a test chart.

(i) Place the printed test chart on the original glass.

(j) Press the [START] button to start the calibration. The message "WAIT" disappears when the calibration is finished.

* The procedure above covers both the color and black copy calibration.

After the automatic calibration, copy and check the image quality.
If further image quality adjustment is necessary, go to the next step.

(2) Enter adjustment mode [05]. Change the values for codes [1613 to 1620] to adjust the amount of toner used.

• The code to use varies according to the paper type. Adjust the value for [05] code corresponding to the paper type for which you would like to improve the image quality and increase the value to obtain the copy density that the user desires.

Paper type	[05] code	Recommended value	Acceptable value range	Default
Thick 1	05-1613		0 to 255	255
Thick 2	05-1614			255
Thick 3	05-1615			255
OHP	05-1616	Set a value larger than 240.		240
SPECIAL 1	05-1617			255
SPECIAL 2	05-1618			255
Thick 4	05-1620			255

* Set the value in increments of approximately 4, while checking the copy image until the optimum value is obtained.

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*The table below shows you the acceptable paper weight for the paper type.

Paper type	Acceptable paper weight	
Thick 1	106 to 163 g/m²	Max. 60 lb. Cover
Thick 2	164 to 209 g/m²	Max. 110 lb. Index
Thick 3	210 to 256 g/m²	Max. 140 lb. Index
Thick 4	257 to 280/m²	Max. 150 lb. Index

* Use the recommended OHP transparencies and special paper.

After adjusting the amount of toner used, copy and check the copy image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure.

(3) Perform color balance adjustment or RGB adjustment to adjust the tint of the colors in general.
*For further information regarding the adjustment procedures, refer to procedure (4) in 2.2 To Closely Match the Color Balance of the Original.

After adjusting the tint of colors, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Enter adjustment mode [05]. Change the values for codes [1779] to [1798] and [7980] to [7983] to adjust the density level of each color.

Color to adjust	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
	User custom	05-7980	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
	User custom	05-7981	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
	User custom	05-7982	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			
	User custom	05-7983	0/1/2			

*Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

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* The value for the code corresponding to the original mode (Text/Photo, Text, or Printed image) will affect the copy image quality in the Full color mode and the Auto color mode.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

• Enter a value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality and a reduction in the life of the consumables

• If the adjustment causes a toner fixing problem, decrease the values for codes 05-1613 to 1618.

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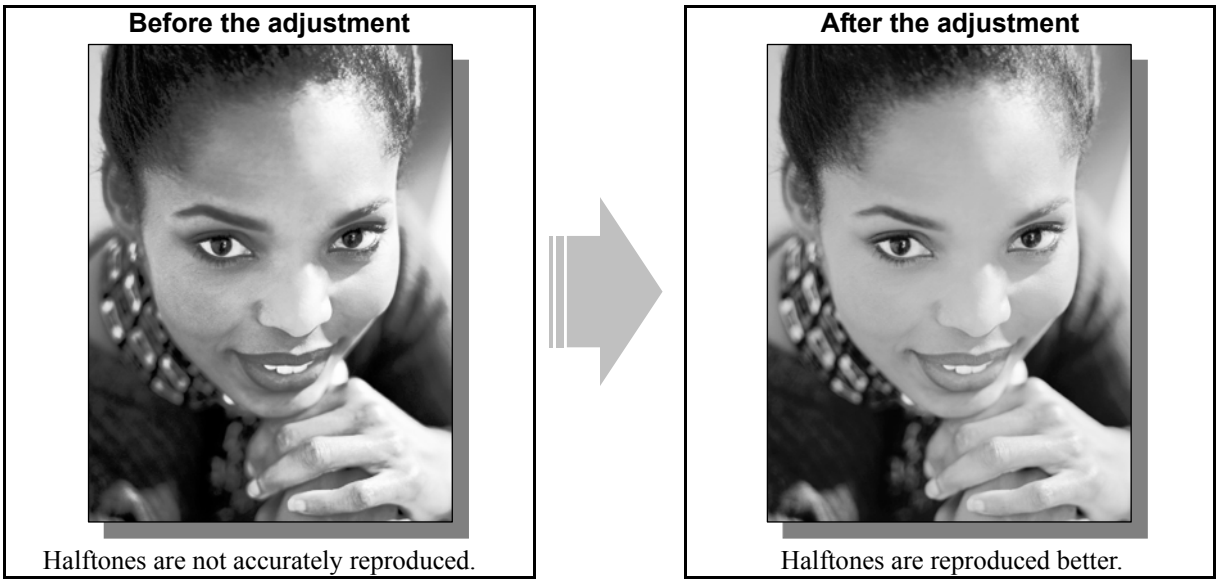
2.14 To Obtain Smooth Gray-Scale Photo Images



❑ Explanation

When a photo image or gradational image is copied in the Black mode with the Text/Photo mode selected, halftones are not accurately reproduced. Select the Photo mode or the Image smoothing mode from among the original mode options, in order to reproduce halftones better in the Black mode.

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❑ Procedures

* Both the service technician and the user can perform all adjustments.

(1) Press the [BASIC] button on the Control Panel. Select "PHOTO" from among the original mode options.
* To have "PHOTO" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After selecting the Photo mode, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) Press the [BASIC] button on the Control Panel. Select "IMAGE SMOOTHING" from among the original mode options.
* To have "IMAGE SMOOTHING" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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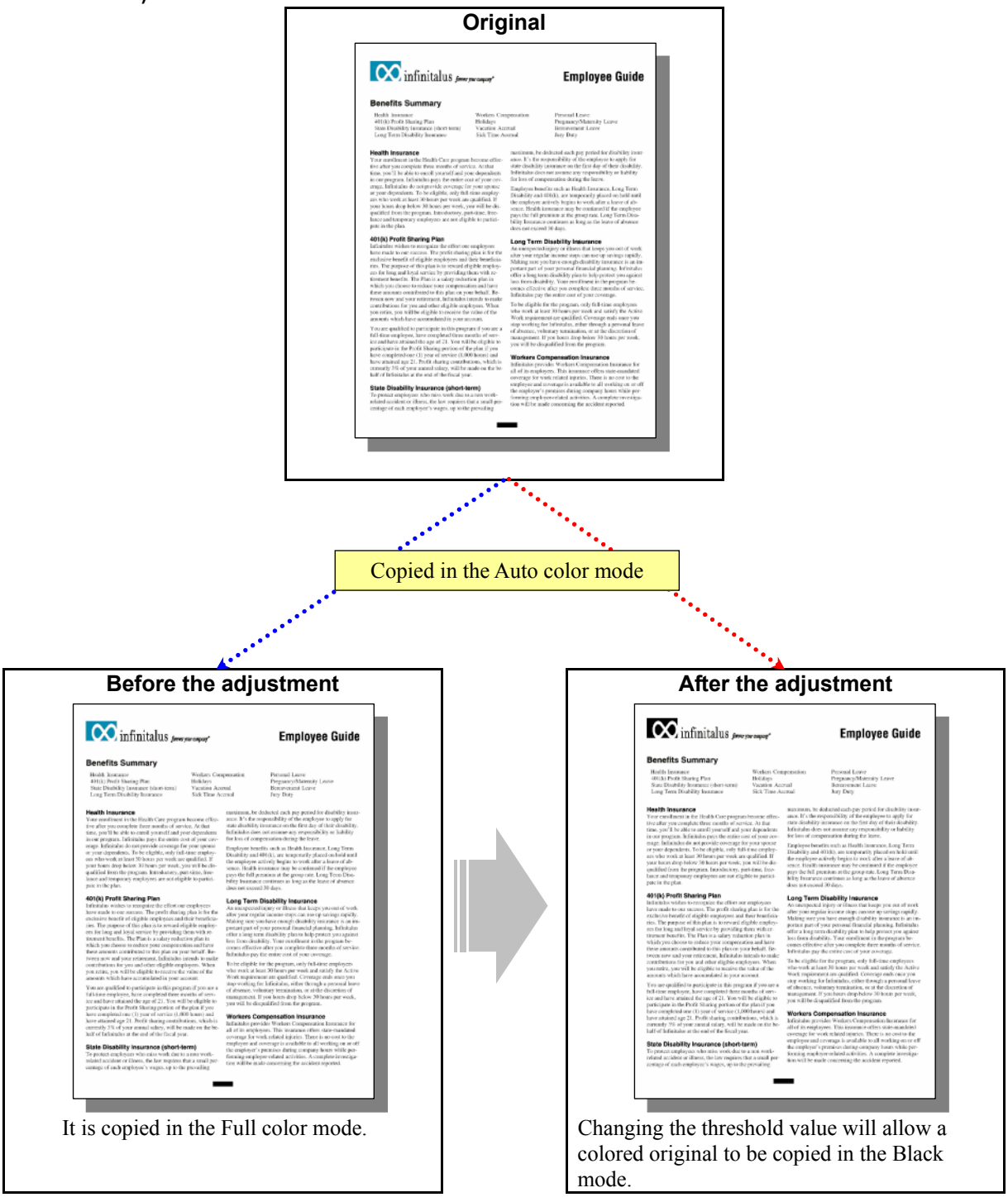
2.15 To Change the Threshold in Auto Color Mode

(To change the threshold between the Full Color mode and the Black mode to meet the user's needs)


Original
Copied in the Auto color mode
Before the adjustment
It is copied in the Full color mode.
After the adjustment
Changing the threshold value will allow a colored original to be copied in the Black mode.

❑ Explanation

When the Auto color mode is selected, it will be automatically determined whether an original is colored or black-and-white. Then it will be copied in the Full color mode or the Black mode. But adjust the threshold value, in order to change the threshold between the Black mode and the Full color mode and suit the preferences of the user.

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❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedure (1).
* Only the service technician must use procedure (2).

(1) Change the threshold for the Auto Color mode.

• Follow steps (a) through (d) to perform the adjustment.

(a) Press the [USER FUNCTIONS] tab on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] button.

(c) Press the [COPY] button.

(d) Change the threshold with the "ACS ADJUSTMENT" indicator. If you move the indicator to the left, the original tends to be judged as a black original. If you move it to the right, the original tends to be judged as a color original.

<Hint> The relation between the position of the "ACS ADJUSTMENT" indicator and the judgment result is shown below. In the actual adjustment, the threshold varies depending on the shape and size of the original or the density level of the original image. Therefore use the table below only as a reference.

Position of indicator	Adjustment value	No. of stamps	No. of red characters
0	+230	Approx. 10 judged as color	Approx. 100
1	+190	Approx. 5 judged as color	Approx. 60
2	+150	Approx. 3 judged as color	Approx. 40
3	+90	Approx. 2 judged as color	Approx. 20
4	+40	Approx. 1 judged as color	Approx. 10
5	0	Approx. 1/2 judged as color	Approx. 6
6	-20	Approx. 1/2 judged as black	4 or more

* Position of indicator: "0" in the table above denotes the left end of the indicator (the original is judged as black most) and "6" denotes the right end of the indicator (the original is judged as color most).
* Adjustment value: This refers to the judgment threshold for the Auto Color mode. The adjustment value of the code in step (2) below will be added to this value.
* The diameter of the standard "stamp" is approx. from 8 mm to 12 mm. In this field the number of the stamps on the chart and its judgment result are described.
* The size of the standard "red character" is approx. 10.5 pt. In this field the number of the red characters entered and its judgment result are described.

After specifying the original size and copy size, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

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(2) Enter adjustment mode [05]. Change the values for codes [1675/1676] to adjust the threshold value in the Auto color mode.

* As the set value is increased, the original will be more likely to be recognized as black-and-white. On the other hand, if the value is decreased, it will be more likely to be recognized as full color.

Threshold to adjust	[05] code	Acceptable value range	Default
Threshold when an original is manually placed on the original glass	05-1675	0 to 255	70
Threshold when an original is placed on the original glass from the RADF (MR-3018)	05-1676	0 to 255	70

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.

❑ Precautions after the completion of the adjustment

• When a non-standard sized original is copied, an area outside the original (or the original cover) may also be scanned. This may prevent the original size from being accurately detected. If the original cover is soiled, the type of original cannot be accurately detected. Therefore, instruct the users to clean the original cover on a routine basis (once a week).

• After the threshold in the Auto color mode is adjusted, based on a particular type of original, other types of original may not be correctly detected. Therefore, carefully perform the adjustment, while checking whether any type of original is correctly detected.

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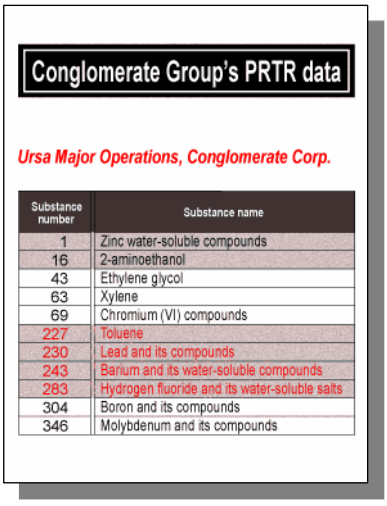
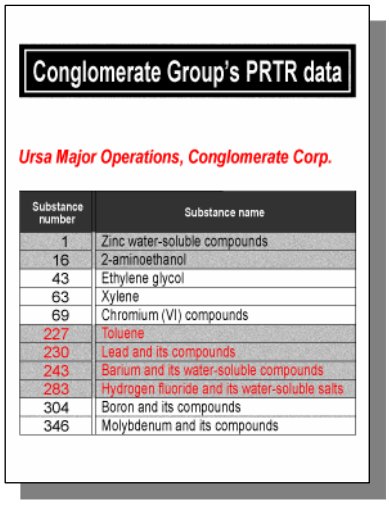
2.16 To Adjust the Twin-Color Copy Image Quality

Before the adjustment



When a twin-color copy is made in the red and black mode, red may be blended in a part of black area.

After the adjustment



The blend of undesired colors in the black area is reduced.

❑ Explanation

When a twin-color copy is made, red may be blended into the black area or colors other than black on the twin-color copy may look different from what the user desires. Adjust the tint of the colors, the reproducibility of black in the Red and black mode, or the boundary between black and colors other than black, in order to reduce a blend of undesired colors into the black area or adjust the tint of colors other than black.

❑ Procedures

* The procedure to use varies, depending on whether to adjust the tint of colors other than black, the reproducibility of black in the Red and black mode, or the boundary between black and colors other than black. Refer to the procedure corresponding to the user's particular request.

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2.16.1 To Adjust the Tint of Colors other than Black

*Both the service technician and the user can perform all adjustments.

(1) Press the [IMAGE] button on the Control Panel. Press the [TWIN COLOR COPY] button.
Select the Twin-color copy mode from among the twin color copy mode options.

• To select Red and black mode:
Press the [RED & BLACK] button.

• To select the Twin-color selectable mode:
Use steps (a) through (d) to select the Twin-color selectable mode.
(a) Press the [TWIN COLOR SELECTABLE] button.
(b) Press the [CHANGE BLACK TO] button. Press the button for the desired color.
(c) Press the [SECOND COLOR] button. Press the button for the desired color.
(d) Press the [ENTER] button.

Use procedure (2).

(2) Press the [ADJUST] button. Press the [+] button or the [-] button for the color to be adjusted, in order to adjust the tint of colors other than black.

• In the Red and black mode:
  • Press the [-] button to decrease yellow and the [+] button to enhance magenta, in order to enhance the tint of red.
  • Press the [+] button to enhance yellow and the [-] button to decrease magenta, in order to decrease the tint of red.

• In the Twin-color selectable mode:
Press the [+] button to enhance the tint of the color or the [-] button to decrease it.

*Press the [DETAIL] button. The tint of the color can be adjusted according to the density area (low-, medium- or high-density area).

❑ Precautions after the completion of the adjustment

Nothing in particular.

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2.16.2 To Adjust the Reproducibility of Black in the Red and Black Mode

* The service technician must perform all adjustments.

(1) Enter adjustment mode [05]. Set "1" for code [1761] to change the setting, which is intended to improve the reproducibility of black areas.

* If you are making a twin-color copy in the red and black mode, red may be blended into the black area. In this case, switching the value for this code reduces a blend of red in the black area on the copy.

Value for 05-1761	Reproducibility of black in the red and black mode for a twin-color copy
0	Default
1	Intended to improve the reproducibility of black

❑ Precautions after the completion of the adjustment

Setting "1" for code 05-1761 may not provide a clear boundary between red and black. Therefore, carefully perform the adjustment, while checking the copy image.

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2.16.3 To Adjust the Boundary between Black and Colors other than Black

* Both the service technician and the user can use procedures (1) and (2).
* Only the service technician must use procedure (3).
* Note that the adjustment results of steps (1) and (2) will be applied only to the Red and Black mode. The adjustment result of step (3) will be applied to both of the Red and Black mode and the Twin Color mode (enabling selection of other colors).

(1) Press the [IMAGE] button on the Control Panel. Press the [TWIN COLOR COPY] button. Press the [RED&BLACK] button to enter the Red and black mode.

Use procedure (2).

(2) Press the [ADJUST] button. Press the [←] button or the [→] button for Range Adjustment, in order to adjust the boundary between red and black.

- [←] "RED": The black area decreases and the red area increases.
- [→] "BLACK": The black area increases and the red area decreases.

After adjusting the boundary, copy and check the copy image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure.

(3) Enter adjustment mode [05]. Change the values for codes [7641/7642] to adjust the boundary between black and colors other than black.

* As the set value is increased, the area of "CHANGE BLACK TO" will become larger. On the other hand, if the value is decreased, the area of "SECOND COLOR" will become larger.

Mode to adjust	[05] code	Subcode	Recommended value	Default
Red and black mode	05-7641	0/1/2	0 to 255	128
Twin color – Red and black mode ("RED" selected in Twin color selectable mode)	05-7642			

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	High-density area
1	Medium-density area
2	Low-density area

❑ Precautions after the completion of the adjustment

Nothing in particular.

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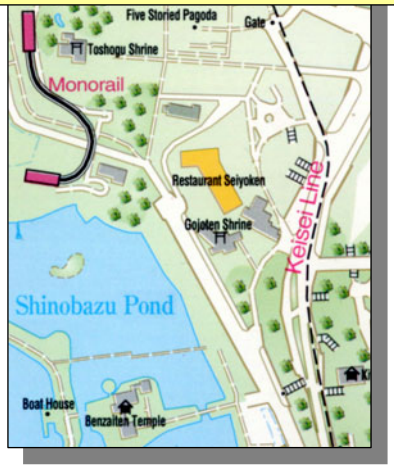
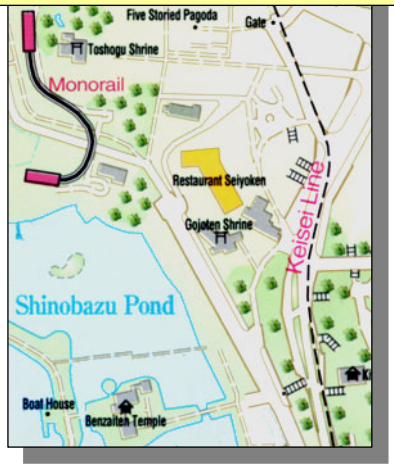
2.17 To Adjust the Image Quality Scanned from the RADF

Before the adjustment

To scan an original placed on the original glass



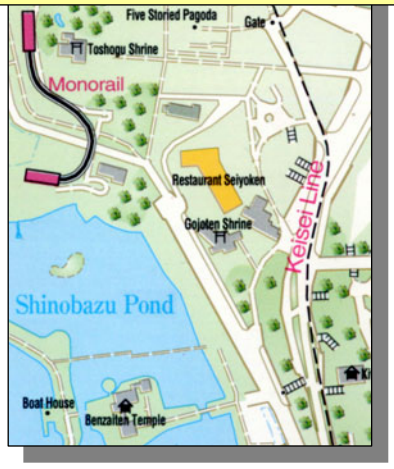
To scan an original fed from the RADF



The reproducibility of background may vary, depending on how to scan an original.

After the adjustment

To scan an original placed on the original glass



To scan an original fed from the RADF

The gap in the reproducibility of background is reduced.

❑ Explanation

The reproducibility of the background may vary, depending on the type of original, or whether the scanning is of an original placed on the original glass or one fed from the RADF (MR-3018). Adjust the reproducibility of background, while scanning an original fed from the RADF, in order to minimize the gap in the reproducibility of the background, using either method of how to scan an original.

* Note that the adjustment results of steps (1) and (2) will be applied only to the Red and Black mode. The adjustment result of step (3) will be applied to both of the Red and Black mode and the Twin Color mode (enabling selection of other colors). Only if further adjustment is still desired for the reproducibility of background, should this adjustment be performed.

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❑ Procedures

* The service technician must perform all adjustments.

(1) Enter adjustment mode [05]. Change the value for the code [3009] or [362] to adjust the reproducibility of the background when using the RADF.

Color mode	[05] code	Recommended value	Acceptable value range	Default
Full color	05-361	Set a value larger than 3 to increase the background density. Set a value smaller than 2 to decrease the background density.	0 to 4	0
Black	05-362			

* Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained. (When changing the value from the default value for the first time, it is recommended to set "2.")

* The table below shows you the correlation between the value and image quality.

Value	Advantage of image quality	Reproductivity of background
0	Default (equivalent to the one obtained when an original placed on the original glass is scanned)	---
1	Lighter background is reproduced than the one obtained when "2" is set.	Light
2	Lighter background is reproduced than the one obtained when the default value is set.	↓
3	Darker background is reproduced than the one obtained when the default value is set.	↓
4	Darker background is reproduced than the one obtained when "3" is set.	Dark

After setting the value, copy and check the image quality.
If further image quality adjustment is necessary, go to the next step.

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(2) Enter the adjustment mode [05]. Change the values for codes [7025], [7064] to [7065] or [7675] to adjust the reproducibility of the background when using the RADF.

Color mode	[05] code	Recommended value	Acceptable value range	Default
Black	05-7025	Set a value smaller than 128 to increase the density level of the background. Set a value larger than 128 to decrease the density level of the background.	0 to 255	128
ACS / Black	05-7675			
Full Color	05-7764			
Monocolor	05-7765			
Twin Color	05-7766			

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.

❑ Precautions after the completion of the adjustment

Correctly adjusting the installation heights of the MFP and the RADF is a prerequisite to perform this adjustment. Therefore, perform all the necessary adjustments. Only if further adjustment is still desired for the reproducibility of background, should this adjustment be performed.

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2.18 To Program Frequently Used Copy Settings
(To Use Custom Mode)

❑ Explanation

Five original modes (Text/Photo, Text, Printed image, Photo and Map) are available for the color modes and four original modes (Text/Photo, Text, Photo and Image smoothing) are available for the black mode by default. However, a new original mode adjusted to be able to satisfy the user's particular requests about image quality can be added as a "custom" mode. One custom mode can be added for each of the color and black modes. For users who frequently use the special type of originals or who are not satisfied with the image quality of the existing original modes, it is recommended to register a set of copy settings that satisfy the user's particular requests as the custom mode.

* The custom mode is made by adjusting image quality based on the Text/Photo mode, according to originals to be used. It is also available to use the custom mode as an independent original mode. This means that the change of the setting values in the custom mode does not affect each default original modes.

❑ Procedures

The adjustment procedure differs depending on whether in the black mode or the full color mode the settings in the custom mode are adjusted. Ask the user which mode he or she uses and then refer to the procedure that is more suitable for his or her request.

2.18.1 To Adjust Custom Mode Settings in Black Mode

* All the steps in the adjustment procedure shall be performed by the service technician.

(1) Enter the setting mode [08]. Change the value for the code [508] to enable the functions of the custom mode in the black mode.

Value for 08-508	Custom mode for black mode
0	Unused
1	Used (Text/Photo base)

* The default adjustment value for the custom mode is preset at the one that reproduces image quality equivalent to that of the Text/Photo mode in the black mode at the shipment.

After setting the value, go to the next step.

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(2) Enter the adjustment mode [05]. Adjust each setting value for the custom mode to satisfy the user's request.

• Select the necessary adjustments from the procedures below.

To match the density level of background scanned with the original glass equivalent to that of background scanned with the RADF

(a) Enter the adjustment mode [05]. Change the value for the code [7025] to adjust the reproducibility of the background of the image scanned with the RADF. The larger the setting value is, the darker the background becomes. The smaller the setting value is, the lighter the background becomes.

[05] code	Recommended value	Acceptable range value	Default
05-7025	Set a value smaller than 128 to make the background darker. Set a value larger than 128 to make the background lighter.	0 to 255	128

To copy while eliminating the background color (to adjust the reference value for the background density adjustment)

* This adjustment is effective when you do not copy the dark color of the background of an original.

(a) Enter the adjustment mode [05]. Change the values for codes [7236] and [7237] to make the range correction operation fixed.

• The code to be set differs depending on the density mode. Select the [05] code for the target original mode and change the value to "0".

Original mode	Density mode	[05] code	Recommended value	Acceptable range value	Default
Text/Photo	Automatic	05-7236	0	0, 1	1
	Manual	05-7237			

* Explanation for setting values

Setting value	Range correction operation
0	Fixed
1	Varied

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To increase the sharpness intensity

* This adjustment is effective when you want to copy light text, thin lines or illustrations more clearly.

(a) Enter the adjustment mode [05]. Change the value of the code [922] to adjust the default value for the sharpness intensity.

Color mode	Original mode	[05] code	Recommended value	Acceptable range value	Default
Black	User custom	05-922	Set a value larger than 128. (129 to 228)	0 to 255	128

<Note> If the setting value is too large, Moiré may appear.

To copy text or lines more clearly

(a) Enter the adjustment mode [05]. Increase the value for the code [925] to make the text and lines darker (improving faint text or thin lines).

Original mode	[05] code	Recommended value	Acceptable range value	Default
User custom	05-925	Set a value larger than 2.	0 to 4	2

<Note> If the setting value is too large, the life of consumables may be shortened.

To adjust copy density

(a) Enter the adjustment mode [05]. Change the value for the codes [931] and [940] to adjust the copy density. The larger the setting value is, the darker the image becomes. The smaller the setting value is, the lighter the image becomes.

Base original mode	Density mode	[05] code	Recommended value	Acceptable range value	Default
Text/Photo	Automatic	05-940	Set a value smaller than 128 to make the image darker.	0 to 255	128
	Manual	05-931	Set a value larger than 128 to make the image lighter.		

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To adjust the changing amount of "ACS ADJUSTMENT" indicator

(a) Enter the adjustment mode [05]. Change the values for codes [934] and [937] to adjust the changing amount of the "ACS ADJUSTMENT" indicator per step for the manual density mode. The larger the setting value is, the larger the changing amount per step becomes. The smaller the setting value is, the smaller the changing amount per step becomes.

Base original mode	Moving direction in indicator	[05] code	Recommended value	Acceptable range value	Default
Text/Photo	Light step	05-934	Set a value smaller than 20 to make the changing amount smaller. Set a value larger than 20 to make the changing amount larger.	0 to 255	20
	Dark step	05-937			

* Light step: Moving the indicator to the [◖] side.
  Dark step: Moving the indicator to the [◗] side.

<Note> If the setting value is too small or too large, the density level may not be changed (the number of steps moved may not be detected) even if the user moves the indicator on the touch panel.

To adjust gamma balance in medium- and high-density areas

(a) Enter the adjustment mode [05]. Change the value for the code [949] to adjust the gamma balance in each of medium- and high-density areas.

Base original mode	[05] code	Subcode	Recommended value	Acceptable range value	Default
Text/Photo	05-949	1/2	Set a value smaller than 128.	0 to 255	128

* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained. Note that gradations (density level) in the medium- and high-density areas may be reversed with some setting values.

* Subcodes to be entered differ depending on the target density area. Refer to the table below to enter the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
1	Medium-density area
2	High-density area

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To make background lighter

(a) Enter the adjustment mode [05]. Increase the values for codes [7279] and [7280] to make the background lighter.

Base original mode	Density mode	[05] code	Recommended value	Acceptable range value	Default
Text/Photo	Automatic	05-7279	Set a value larger than 128.	0 to 255	128
	Manual	05-7280			

* Set the value in increments of approximately 25, while checking the copy image until the optimum value is obtained.

❑ Cautions after the adjustment

Nothing in particular

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2.18.2 To Adjust Custom Mode Settings in Color Mode

* All the steps in the adjustment procedure shall be performed by the service technician.

(1) Enter the setting mode [08]. Change the value for the code [506] to enable the functions of the custom mode in the color mode.

Value for 08-506	User mode for color mode
0	Unused
1	Used (Text/Photo base)

* The default adjustment value for the custom mode is preset at the one that reproduces image quality equivalent to that of the Text/Photo mode in the color mode at the shipment.

After setting the value, go to the next step.

(2) Enter the adjustment mode [05]. Adjust each setting value for the custom mode to satisfy the user's request.

• Select the necessary adjustments from the procedures below.

To make background lighter

(a) Enter the adjustment mode [05]. Increase the values for codes [7762] and [7763] to make the background lighter.

Base original mode	Density mode	[05] code	Recommended value	Acceptable range value	Default
Text/Photo	Automatic	05-7762	Set a value larger than 128.	0 to 255	128
	Manual	05-7763			

* Set the value in increments of approximately 25, while checking the copy image until the optimum value is obtained.

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To copy while eliminating the background color (to adjust the reference value for the background density adjustment)

* This adjustment is effective when you do not copy the dark color of the background of an original.

(a) Enter the adjustment mode [05]. Change the values for codes [7777] and [7778] to make the range correction operation fixed.

• The code to be set differs depending on the density mode. Select the [05] code for the target original mode and change the value to "0".

Original mode	Density mode	[05] code	Recommended value	Acceptable range value	Default
Text/Photo	Automatic	05-7777	0	0, 1	1
	Manual	05-7778			

* Explanation for setting values

Setting value	Range correction operation
0	Fixed
1	Varied

To increase the sharpness intensity

* This adjustment is effective when you want to copy light text, thin lines or illustrations more clearly.

(a) Enter the adjustment mode [05]. Change the value for the code [7795] to adjust the default value for the sharpness intensity.

Color mode	Original mode	[05] code	Recommended value	Acceptable range value	Default
Full color	User custom	05-7795	Set a value larger than 128. (129 to 228)	0 to 255	128

<Note> If the setting value is too large, Moiré may appear.

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To copy text or photos more clearly

* This adjustment is effective when you want image quality emphasizing text or photos.

(a) Enter the adjustment mode [05]. Change the value of the code [7841] to adjust the reproducibility of the Text/Photo mode.

Color mode	Original mode	[05] code	Recommended value	Acceptable range value	Default
Full color	User custom	05-7841	Set 1 or 2 to emphasize photos. Set 4 or 5 to emphasize text.	0 to 5	0

* Explanation for setting values

Setting value	Reproducibility level	Characteristics
0	Default	
1	Photo oriented-2	The reproducibility level of photos on printed images is higher than that of "Photo oriented-1".
2	Photo oriented-1	The reproducibility level of photos on printed images is higher than that of "default".
3	Equivalent to default	
4	Text oriented-1	The reproducibility level of text on printed images is higher than that of "default".
5	Text oriented-2	The reproducibility level of text on printed images is higher than that of "Text oriented-1".

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To adjust gamma balance

* This adjustment is effective when you change the gamma balance of the copied image.

(a) Enter the adjustment mode [05]. Change the values for the codes [7980] to [7983] to adjust the gamma balance of each color.

Adjustment	Original mode	[05] code	Subcode	Recommended value	Acceptable range value	Default
Y (Yellow)	User custom	05-7980	0/1/2	Set a value larger than 128.	0 to 255	128
M (Magenta)		05-7981				
C (Cyan)		05-7982				
K (Black)		05-7983				

* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

* Subcodes to be entered differ depending on the target density area. Refer to the table below to enter the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

❑ Cautions after the adjustment

Nothing in particular

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2.19 To Copy While Erasing Shadow Outside of Image

Before the adjustment

When originals such as books are copied, an area outside of the image is copied like a shadow because the original cover is not fully closed.

After the adjustment

The shadow is erased.

❑ Explanation

When originals such as books are copied, an area outside of the image is copied like a shadow because the original cover is not fully closed. Use the Outside Erase function to avoid copying areas outside of the image.

❑ Procedures

* Both the service technician and the user can use all the steps of this adjustment.

(1) Press the [EDIT] tab on the touch panel and then press the [OUTSIDE ERASE] button.
Change the border between the original and areas not belonging to the original by pressing either [+] or [-] as required.

* When you adjust it to [+] side, the area to be detected as that not belonging to the original is widened. When you adjust it to [-] side, the area to be detected as that not belonging to the original is narrowed.

<Notes>

The Outside Erase function may not be operated correctly under the following conditions:

* When making copies in a bright room, leaving the RADF or the Platen Cover opened (The density of areas not belonging to the original is lowered due to outside light.)
* When the original has extremely dark areas (The extremely dark areas are wrongly detected as areas not belonging to the original and thus erased.)
* In case of special originals (e.g. a three-dimensional object, an original with black edges, the edges of an opened book)

❑ Caution after the adjustment

Areas not belonging to the original may not be erased exactly as the user has requested (erased too much or not erased at all) depending on the type of the original. Also the area to be erased may change depending on the orientation of the original. Therefore adjust it carefully while checking the copy image.

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2.20 To Avoid Copying Blank Page of Original Scanned with RADF

Before the adjustment

When the original is scanned with the RADF, blank pages included in the original are also copied.

After the adjustment

The blank pages are omitted.

❑ Explanation

When the original is scanned with the RADF, blank pages included in the original are also copied. To copy while omitting the blank pages automatically, the Blank Omit Pages function must be set and its threshold for judging if the page is blank or not must be adjusted. However, colored originals with no text or images are not omitted even this adjustment was performed because they cannot be detected as “blank pages” with this function.

* Target originals
  - The back side of an original with dark images on its front side (the dark images can be seen through the back side) or an original with light color
  - An original with only 3 letters in 10.5 pt. (an original that is omitted as a blank page with the default setting)

❑ Procedures

* You can start with any of the steps. However, it is recommended to perform the steps in order as listed below.
* Both the service technician and the user can use step (1) and (2).
* Only the service technician can use step (3).

(1) Press the [EDIT] tab on the touch panel and then press the [OMIT BLANK PAGE] button.
Then press the [OK] button to enable the Omit Blank Page function.

After the setting, copy and check the image.
If there is any page other than colored pages that cannot be omitted, the service technician must perform the procedure below.

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(2) Press the [USER FUNCTIONS] button on the Control Panel. Then press [+] or [-] of [OMIT BLANK PAGE ADJUSTMENT].

(3) Enter the adjustment mode [05]. Change the value for the code [7618] to adjust the threshold for judging the original as blank pages.

• The larger the setting value is, the more the original tends to be judged as a blank page.

[05] code	Recommended value	Acceptable range value	Default
05-7618	Set a value larger than 128.	0~255	128

* Set the value in increments of approximately 15 until the optimum value is obtained, while checking if proper originals are judged as a blank page.

❑ Caution after the adjustment

• When the threshold for judging blank pages is changed, the same threshold for in the network scanning function is also changed.

• Originals with a small portion of small letters may be judged as a blank page. Therefore adjust the value carefully while checking the copy image.

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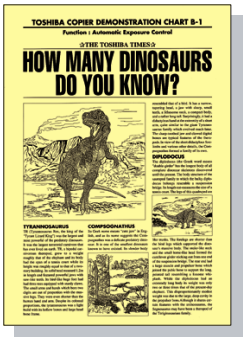
2.21 To Obtain Image in Even Density Level

Original



When the density is adjusted automatically, the density on the entire copy image becomes uneven.

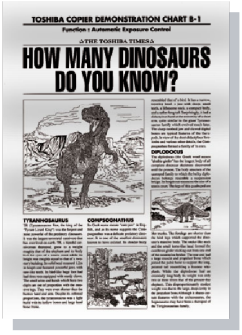
After the adjustment

TOSHIBA COPIER DEMONSTRATION CHART B-1
Function : Automatic Exposure Control
THE TOSHIBA TIMES
HOW MANY DINOSAURS DO YOU KNOW?

Feeding direction

When the density is adjusted manually, the density of the entire copy image is even.

Before the adjustment


TOSHIBA COPIER DEMONSTRATION CHART B-1
Function : Automatic Exposure Control
THE TOSHIBA TIMES
HOW MANY DINOSAURS DO YOU KNOW?

Feeding direction

❑ Explanation

When an original with background is copied with the density adjustment set “automatic”, the density of the background may become uneven. To suppress this unevenness, adjust the density manually.

❑ Procedures

* Both the service technician and the user can use all the steps of this adjustment.

(1) Press the [BASIC] tab on the touch panel and then press [◖] or [◗] to adjust the copy density level.

❑ Caution after the adjustment

Nothing in particular

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3.1 To Maintain a Steady Color Balance

Before the adjustment

The color balance varies according to a change in the environment or a lapse of time.

After the adjustment

The color balance is constantly maintained.

❑ Explanation

The color balance varies according to a change in the environment, replacement of the consumables and so forth. Periodically adjust the color reproducibility (automatic calibration), in order to constantly maintain a steady color balance on the printouts.

Automatic calibration is the basic adjustment to accurately reproduce colors on the printouts. When you would like to accurately reproduce the desired hue or when you have replaced the consumables and changed the operating conditions, perform automatic calibration to ensure the color reproducibility.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Only the service technician must use procedure (1).
* Both the service technician and the user can use procedure (2).

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PCL6 PS3 XPS Mac

(1) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be forcibly performed to correct variations in image contrast.

After exercising image quality control, use the next procedure.

PCL6 PS3 XPS Mac

(2) Perform automatic calibration to correct variations in image density.

*[ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the MFP Management Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

*Use steps (a) through (j) to perform the automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [ADMIN] tab.
(c) Enter an administrator password of 6 to 10 digits. Press the [OK] button.
(d) Press the [GENERAL] button.
(e) Press the [CALIBRATION] button.
(f) Press the [PRINT] button.
(g) Press the [CALIBRATION] button to print out the test chart.
(h) Place the printed test chart on the original glass.
(i) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.
(j) The message "Is a result made to reflect?" will appear. Press the [YES] button.

❑ Precautions after the completion of the adjustment

When image quality control is repeatedly performed, the color balance may slightly vary due to an error even in the same environment.

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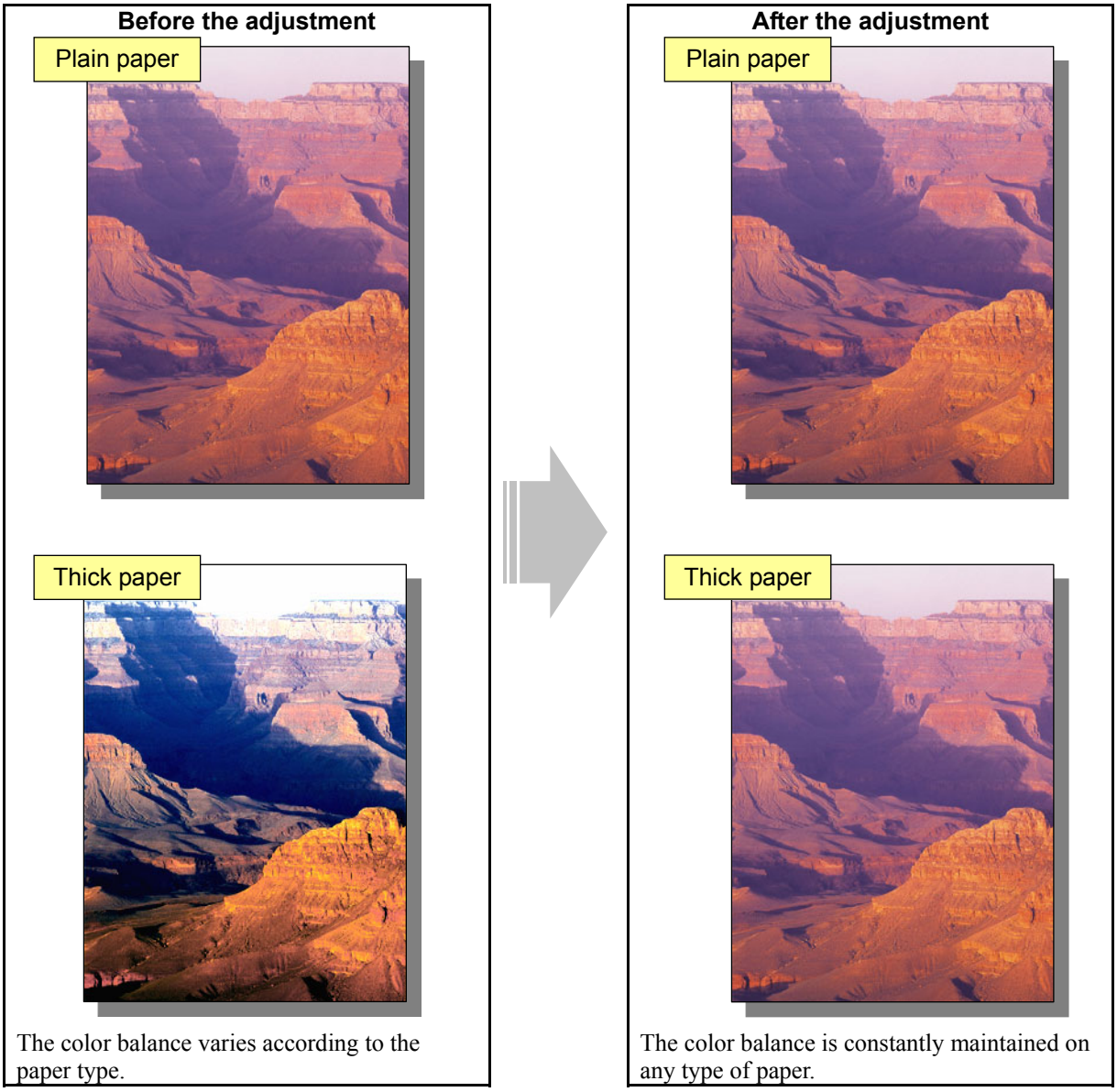
3.2 To Maintain a Steady Color Balance on Thick Paper or Special Paper


Before the adjustment
Plain paper
Thick paper
The color balance varies according to the paper type.
After the adjustment
Plain paper
Thick paper
The color balance is constantly maintained on any type of paper.

❑ Explanation

The color balance varies according to a change in the environment, replacement of the consumables and so forth. The amount of the change varies significantly, according to the paper type. Periodically adjust the color reproducibility (automatic calibration) corresponding to the paper type, in order to constantly maintain a steady color balance on any type of paper.

Automatic calibration is the basic adjustment to accurately reproduce colors on the printouts. When you would like to accurately reproduce the desired hue or when you have replaced the consumables and changed the operating conditions, perform automatic calibration to ensure the color reproducibility.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Only the service technician must use procedure (1).
* Both the service technician and the user can use procedure (2).

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PCL6 PS3 XPS Mac

(1) Enter setting mode [08]. Set "1" for code [9059].

• During automatic calibration, the paper type can be selected and image quality control will be automatically performed.

Value for 08-9059	Image quality control operation during the automatic calibration
0	No paper selecting buttons display
1	Paper selecting buttons displayed. (For both Copy and Printer)

After setting the value, use the next procedure.

PCL6 PS3 Mac

(2) Perform automatic calibration to correct variations in image density.

*[ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate the automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

*Use steps (a) through (l) to perform the automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [ADMIN] tab.

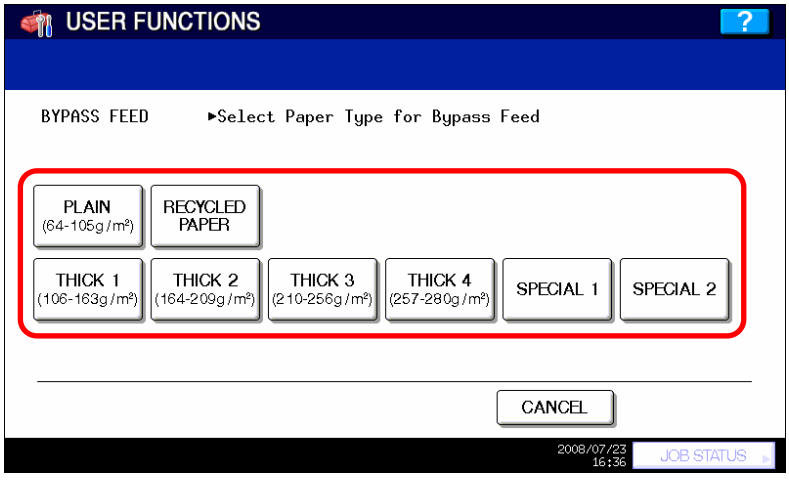
(c) Enter an administrator password of 6 to 10 digits. Press the [ENTER] button.

(d) Press the [GENERAL] button.

(e) Press the [CALIBRATION] button.

(f) Press the [PRINT] button.

(g) Press the button for the paper type to be corrected.



*After the paper type is selected, image quality control is automatically performed.

(h) Load A4/LT-sized paper selected at step (g).

(i) Press the [CALIBRATION] button to print out the test chart.

(j) Place the printed test chart on the original glass.

(k) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.

(l) The message "Is a result made to reflect?" will appear. Press the [YES] button.

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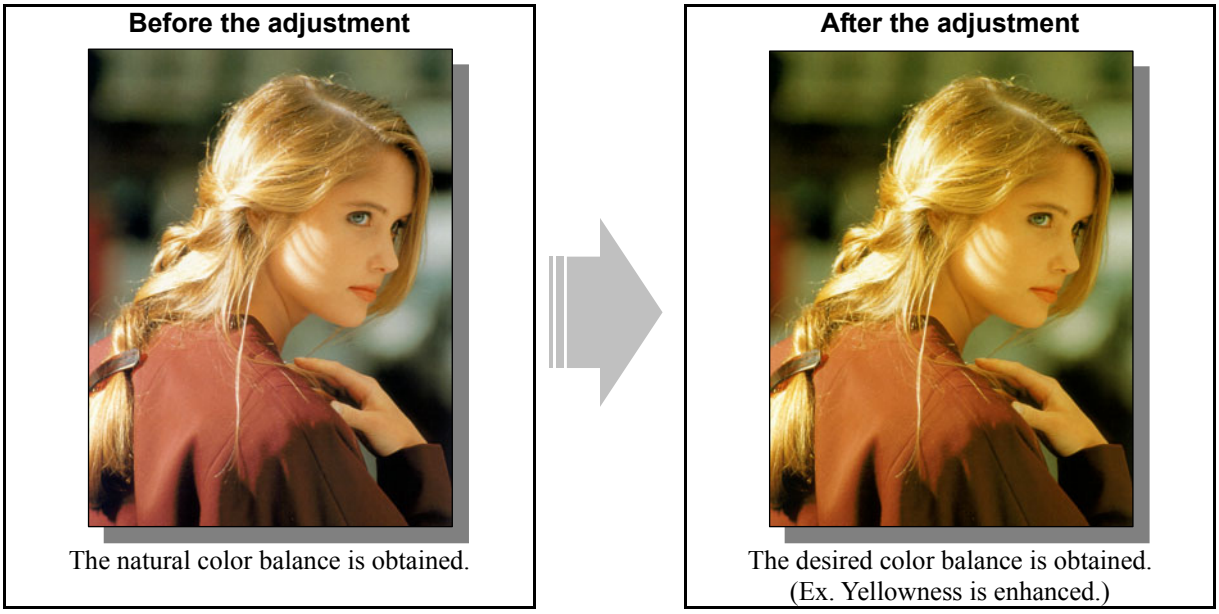
3.3 To Obtain the Desired Color Balance


Before the adjustment
The natural color balance is obtained.
After the adjustment
The desired color balance is obtained.
(Ex. Yellowness is enhanced.)

❑ Explanation

If you would like to change the color balance or darkness of the printouts and reproducibility of halftones in accordance with a type of original or the user's requirements, change the "Image Quality Type" option on the printer driver or adjust the color balance.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Both the service technician and the user can use procedures (1) and (2).
* Only the service technician must use procedure (3).

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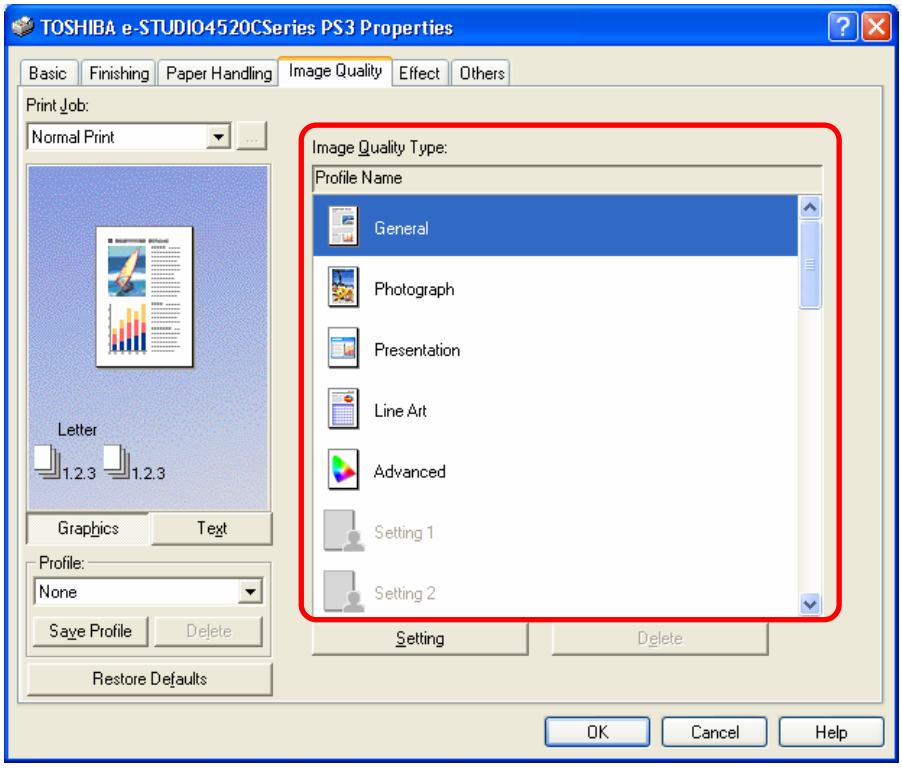
(1) Change the "Image Quality Type" option on the printer driver.

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Change the "Image Quality Type" option in the "Image Quality" tab.



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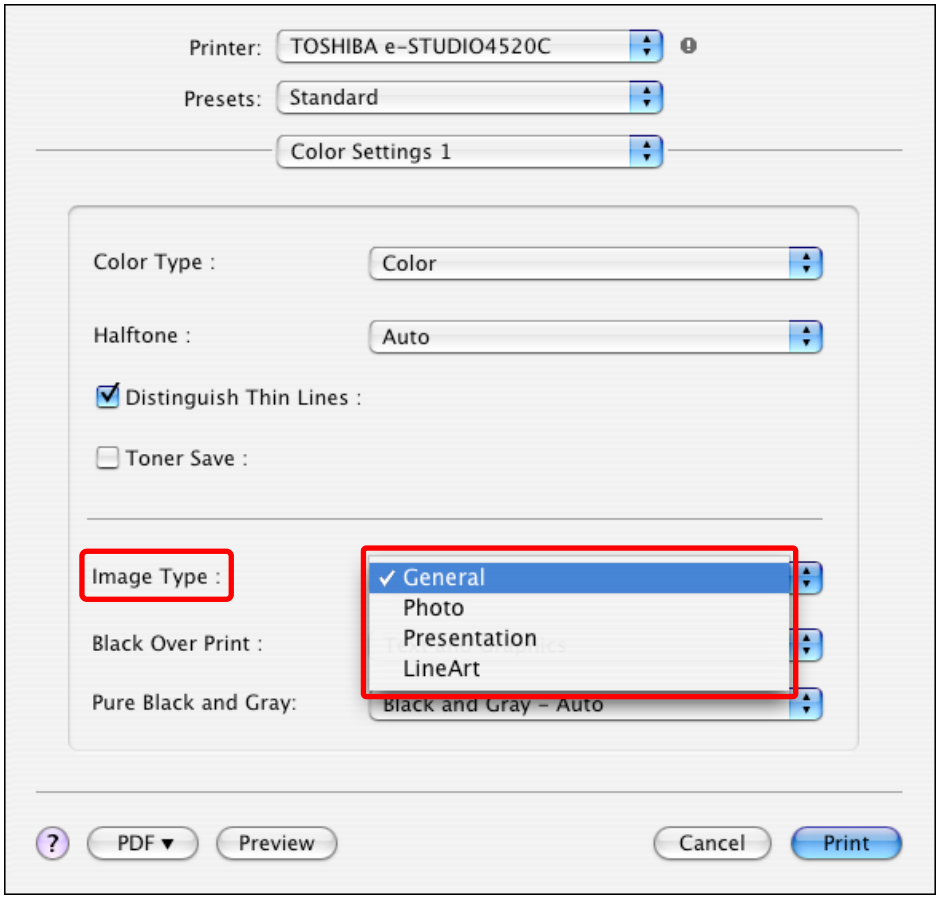
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Change the "Image Type" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 2" ⇨ "Image Type"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Image Type"



* This adjustment will be effective, only if a file created on a general application, such as Microsoft Office, is printed in PostScript (PS3, XPS and Macintosh). It may not be effective, if a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress) is printed, or a PDF file created on these applications is printed using the C, M, Y and K toners. Unmark the "Use PostScript Passthrough" checkbox in the "PostScript Setting" options in the "Others" tab. The "Image Quality Type" option will be effective, if printing on Windows (PS3) is performed (but not on Macintosh) or if a file created on the above applications is printed. However, the color balance may be changed, and also the image quality may be diminished, depending on the type of file.

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* The Image Quality Type options feature the following:

- General: "General" is the best-rounded option to offer fine printouts of any type of original, including text, photographs and graphics. It is suitable for printing using word-processing and spreadsheet software. If "General" is selected, "Smooth," which is intended to improve the reproducibility of gradations, will be applied to graphics and images, while "Detail," which is intended to improve the resolving power, will be applied to text, from among the "Halftone" options (screen).

- Photograph: "Photograph" is intended to improve the reproducibility of halftones, such as photos and gradational images. This provides the color balance closely matching the one on the monitor with sRGB selected as a color space. If "Photograph" is selected, "Smooth," which is intended to improve the reproducibility of gradations, will be applied to graphics and images, while "Detail," which is intended to improve the resolving power, will be applied to text, from among the "Halftone" options.

- Presentation: "Presentation" is intended to improve to the reproducibility of vivid colors. It is suitable for printing presentation materials and graphics, which require sharp-contrast images. The color balance this option provides does not match the one on the monitor, because priority is given to printing in highly vivid colors. If "Presentation" is selected, "Smooth," which is intended to improve the reproducibility of gradations, will be applied to graphics and images, while "Detail," which is intended to improve the resolving power, will be applied to text, " from among the "Halftone" options.

- Line Art: "Line Art" is intended to reproduce thin lines clearly without jaggies visible on the printout. It is suitable for printing out line drawings. The color reproduction this option provides is the same as the one the Presentation option provides. But if "LineArt" is selected, a special operation is provided to reproduce thin lines more clearly. If "Line Art" is selected, "Detail," which is intended to print halftones in detail (with the high frequency), will be applied to graphics, images and text, from among the "Halftone" options.

After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(2) Change the "Color Balance" option, the "Brightness" or "Saturation" option on the printer driver.

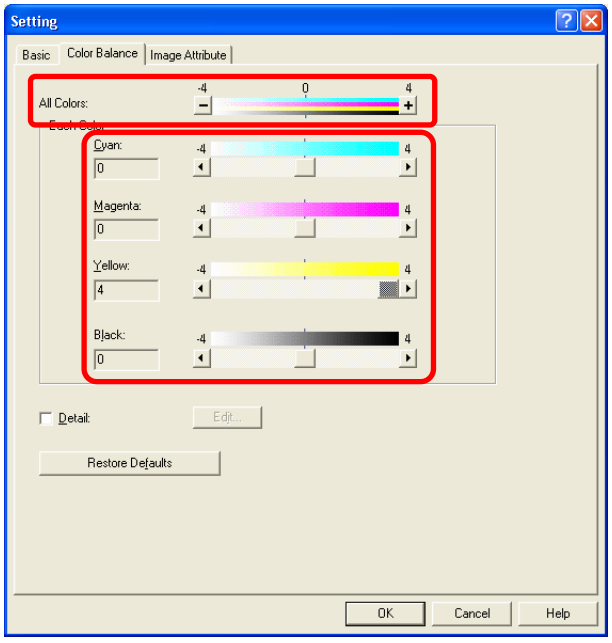
For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

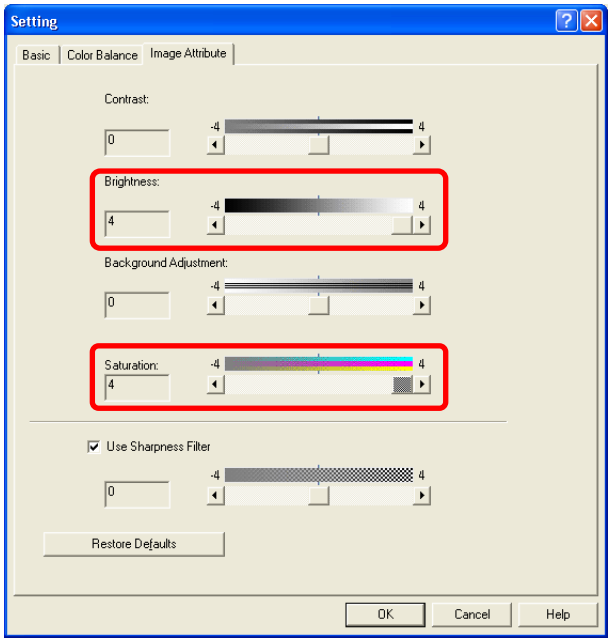
Open the property page of the printer driver. Press the [Image Type Quality] button in the "Image Quality" tab.
Change the option in the "Color Balance" or "Image Attribute" tab.

*Initially, change the value by 4 steps, while checking the printouts until the optimum value is obtained.

• "Color Balance" tab: Change the "All Colors" or "Each Color" option



• "Image Attribute" tab: Change the "Brightness" or "Saturation" option.



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For Macintosh

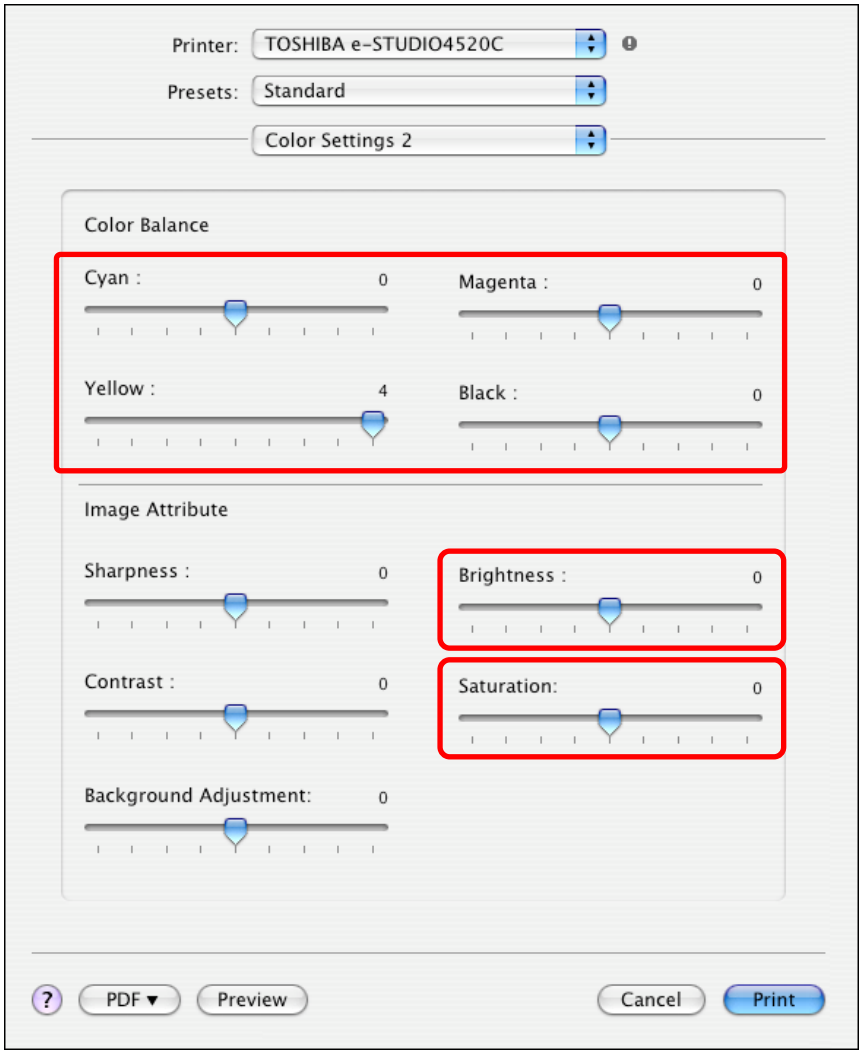
Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Change the "Color Balance" option, the "Brightness" or "Saturation" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 3" ⇨ "Color Balance" "Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Brightness" or "Saturation"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Color Balance," "Brightness" or "Saturation"

* Initially, change the value by 4 steps, while checking the printouts until the optimum value is obtained.



After changing the option on the printer driver, print and check the print image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

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PCL6 PS3 XPS Mac * This adjustment will have an effect only on Auto or Color mode printing.

(3) Enter adjustment mode [05]. Change the values for codes [8042 to 8065] to adjust the color density.

• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL6, Image Quality Type = General, Halftone = Auto

> Text area, Graphic and image area

Change the values of "Smooth" for Y: 05-8058, M: 05-8059, C: 05-0860 and K: 05-8061.

• When printing on Macintosh is performed with the following option selected: Image Type = Photograph, Halftone = Smooth

> Change the values for Y: 05-8050, M: 05-8051, C: 05-8052 and K: 05-8053.

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

Color to adjust	PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	PCL5c	Smooth	05-8058	0/1/2	Set a value larger than 128	0 to 255	128
		Detail	05-8062	0/1/2			
	PS3	Smooth	05-8050	0/1/2			
		Detail	05-8054	0/1/2			
	XPS	Smooth	05-8042	0/1/2			
		Detail	05-8046	0/1/2			
M (Magenta)	PCL5c	Smooth	05-8059	0/1/2			
		Detail	05-8063	0/1/2			
	PS3	Smooth	05-8051	0/1/2			
		Detail	05-8055	0/1/2			
	XPS	Smooth	05-8043	0/1/2			
		Detail	05-8047	0/1/2			
C (Cyan)	PCL5c	Smooth	05-8060	0/1/2			
		Detail	05-8064	0/1/2			
	PS3	Smooth	05-8052	0/1/2			
		Detail	05-8056	0/1/2			
	XPS	Smooth	05-8044	0/1/2			
		Detail	05-8048	0/1/2			
K (Black)	PCL5c	Smooth	05-8061	0/1/2			
		Detail	05-8065	0/1/2			
	PS3	Smooth	05-8053	0/1/2			
		Detail	05-8057	0/1/2			
	XPS	Smooth	05-8045	0/1/2			
		Detail	05-8049	0/1/2			

* Set the value in increments of approximately 20, while checking the printouts until the optimum value is obtained.

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* "Halftone" refers to how halftones are printed. Two options are available: "Smooth" which is intended to improve the reproducibility of gradation and "Detail" which is intended to print halftones in details (with the high frequency).
The halftone option to be applied in printing can be selected from among the "Halftone" options on the printer driver (Windows) or in the print dialog box (Macintosh).
"Auto" is selected from among the "Apply to" options by default. It is intended to automatically select "Smooth" or "Detail" in accordance with "Apply to" of the halftone option, the selected "Color" and "Image Quality Type" options, as described in the table below.

Apply to	"Color" and "Image Quality Type" options					
	Auto/Color				Black and White	Twin Color
	General	Photograph	Presentation	Line Art		
Text	Detail	Detail	Detail	Detail	Detail	Detail
Graphic (Illustration, line, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth
Image (Photograph, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note> • This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the value for [05] code for PCL6 and Smooth is changed, it will be applied to printing performed with PCL6 and Halftone = "Smooth" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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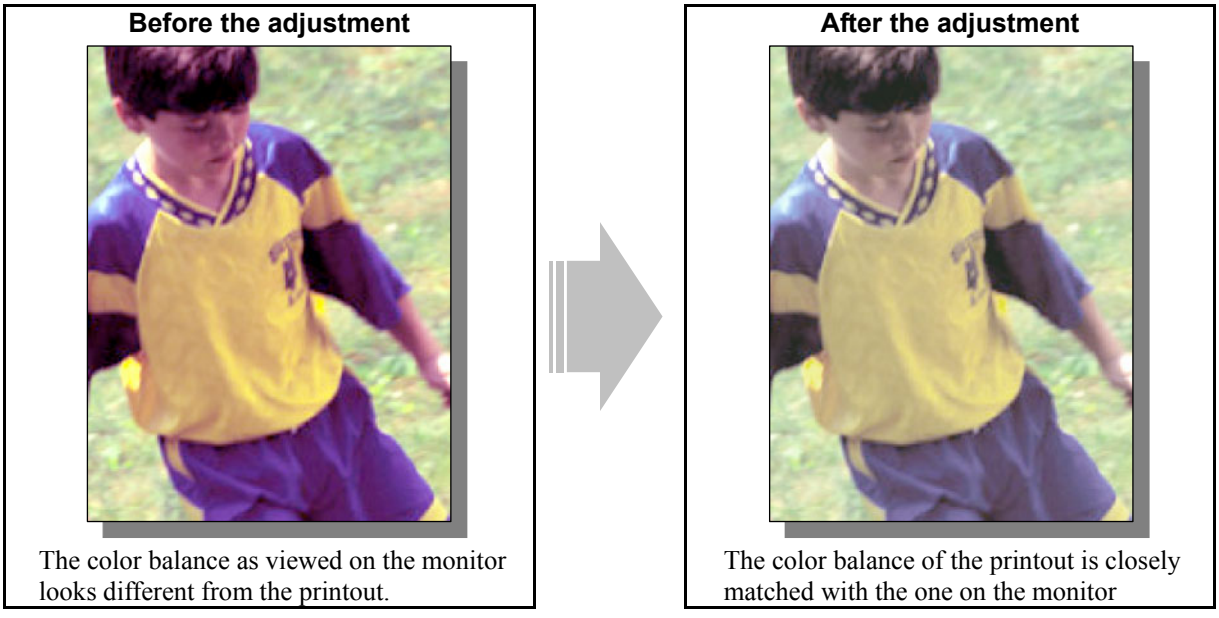
3.4 To Closely Match the Color Balance on the Monitor


Before the adjustment
The color balance as viewed on the monitor looks different from the printout.
After the adjustment
The color balance of the printout is closely matched with the one on the monitor

❑ Explanation

The color balance on the printouts is initially programmed to provide the maximum color saturation within the range of colors reproducible in printing. In general, colors, which can be reproduced, vary, depending on whether they are reproduced on the printout or on the monitor (or depending on whether they are reproduced in "ink" or with the "light"). Consequently, the color balance on the printout cannot be perfectly matched with the one on the monitor. Change the "Image Quality Type" option, in order to closely match the color balance on the printout with the one on the monitor, at a user's request.

* This adjustment will be effective in closely matching the color balance on the printout with the one on the monitor, if the sRGB is selected as a color space. Therefore, remember that it may not be matched with the color balance on the monitor, which does not support sRGB or if a color space other than sRGB is selected. On commercially available monitors, sRGB is not selected as a color space by default.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

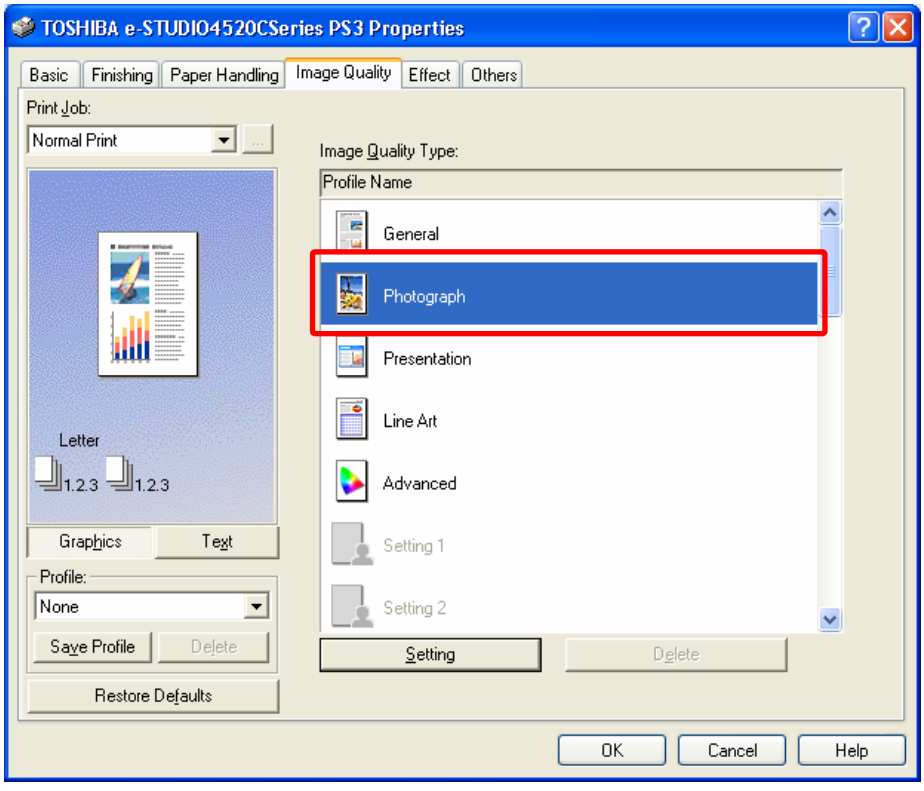
(1) Select "Photograph" from among the "Image Quality Type" options.

*This adjustment will be effective, only if a file created on a general application, such as Microsoft Office, is printed in PostScript (PS3, XPS and Macintosh). It may not be effective, if a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress) is printed, or a PDF file created on these applications is printed using the C, M, Y and K toners. Unmark the "Use PostScript Passthrough" checkbox in the "PostScript Setting" options in the "Others" tab. The "Image Quality Type" option will be effective, if printing on Windows (PS3) is performed (but not on Macintosh) or if a file created on the above applications is printed. However, the color balance may be changed, and also the image quality may be diminished, depending on the type of file.

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Select "Photograph" from among the "Image Quality Type" options.



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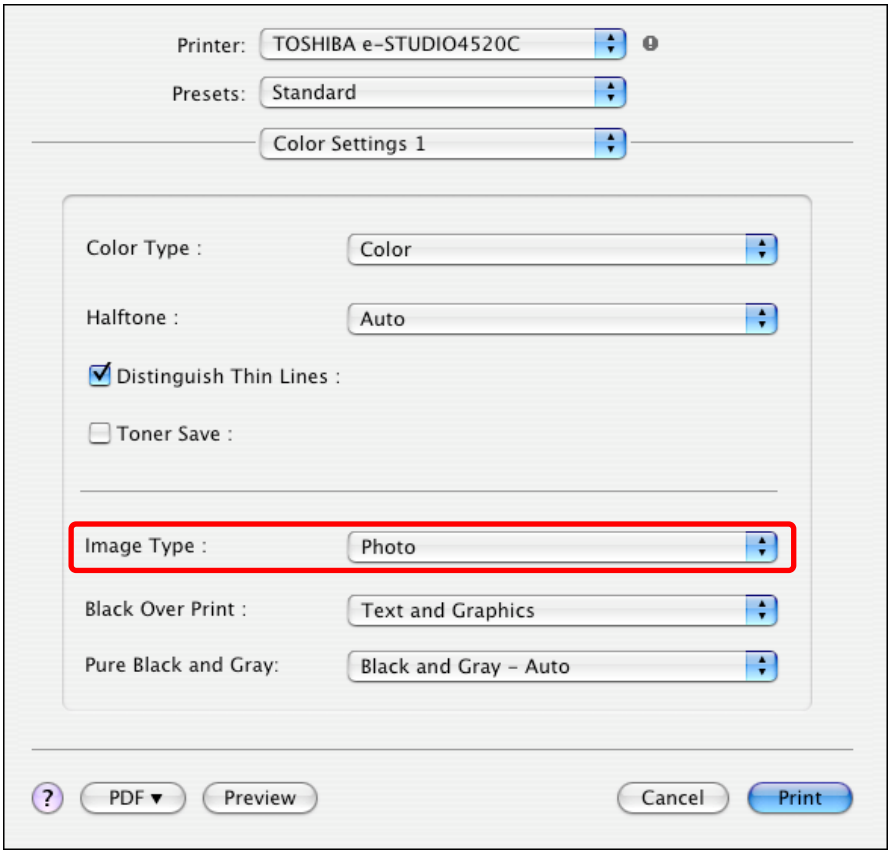
For Macintosh

Mac * This adjustment will have an effect only on full-color printing

Open the print dialog box. Select "Photograph" from among the "Image Type" options.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 2" ⇨ "Image Type"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Image Type"



❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

• Setting a color space to sRGB is a prerequisite to maximize the effectiveness of this adjustment. Therefore, if the monitor does not support sRGB or if color management cannot be performed, the effectiveness of the adjustment may be significantly lost.

• In general, it is impossible to reproduce color saturation closely matching the true colors, as viewed on the monitor, because the range of colors reproducible in toner colors is narrower than the one on the monitor.

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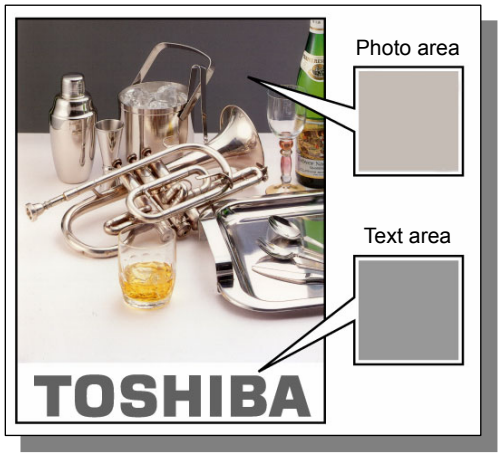
3.5 To Maintain a Uniform Gray Hue

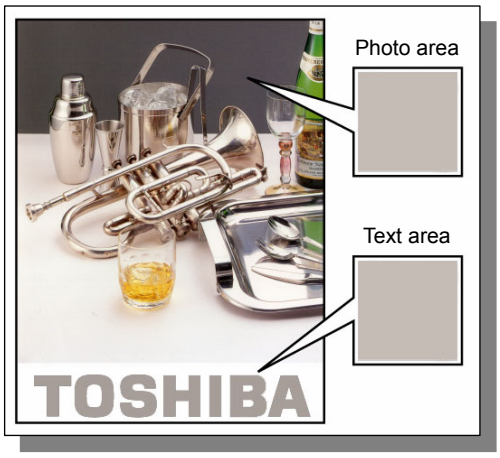
(To maintain Consistency in Gray among Text, Photos and Graphics)

Before the adjustment



How gray is reproduced varies depending on the type of original. As a result, there are variations in gray.

After the adjustment



All color toners are used to reproduce gray. As a result, consistency is maintained in the gray hue.

❑ Explanation

For printing, only the K toner is usually used to reproduce gray areas of drawing data, lines and text. On the other hand, all color toners (C, M, Y and K) are used to reproduce gray areas of image data, such as BMP, GIF, JPEG and TIFF. This provides a deeper gray on the printouts. Change the option on the printer driver, in order to maintain consistency in the gray hue between the drawing data and the image data.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

(1) Change the "Pure Gray" option on the printer driver.

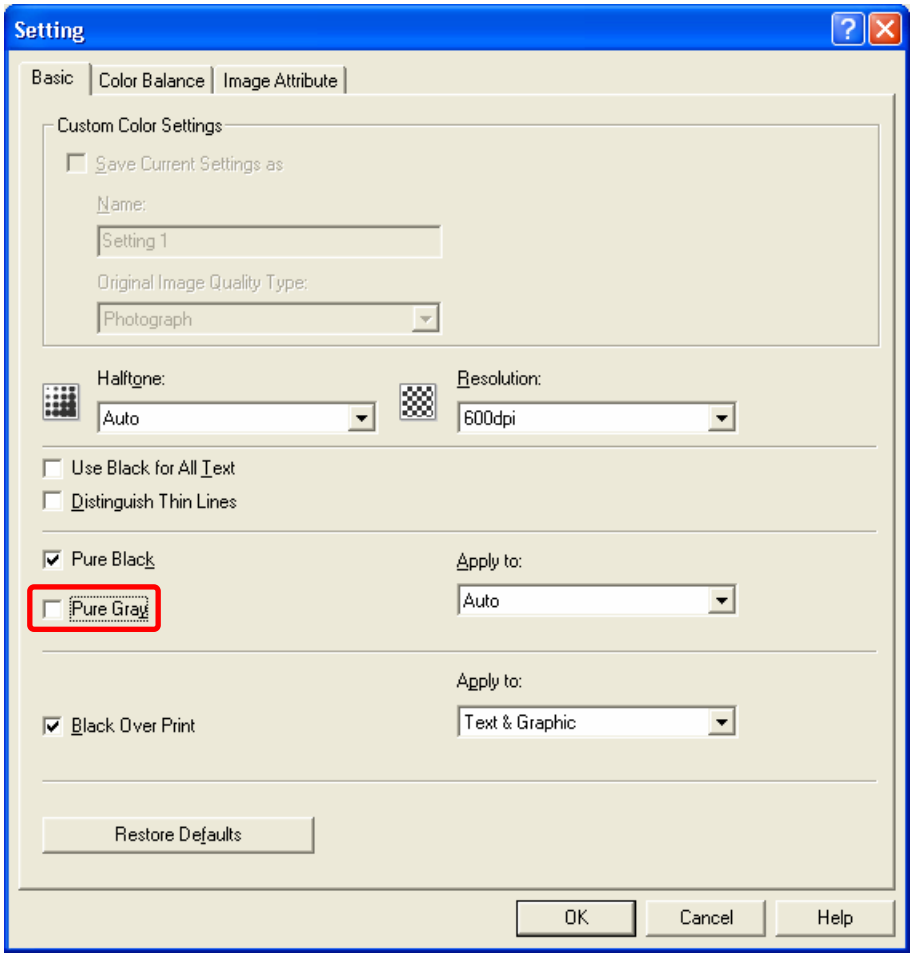
("Pure Gray" allows gray areas to always be reproduced using all color toners (C, M, Y and K) without changing the hue of color areas.)

*This adjustment will be effective, only if a file created on a general application, such as Microsoft Office, is printed. It may not be effective, if a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress) is printed, or a PDF file created on these applications is printed.

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab. Unmark the "Pure Gray" checkbox in the "Basic" tab.



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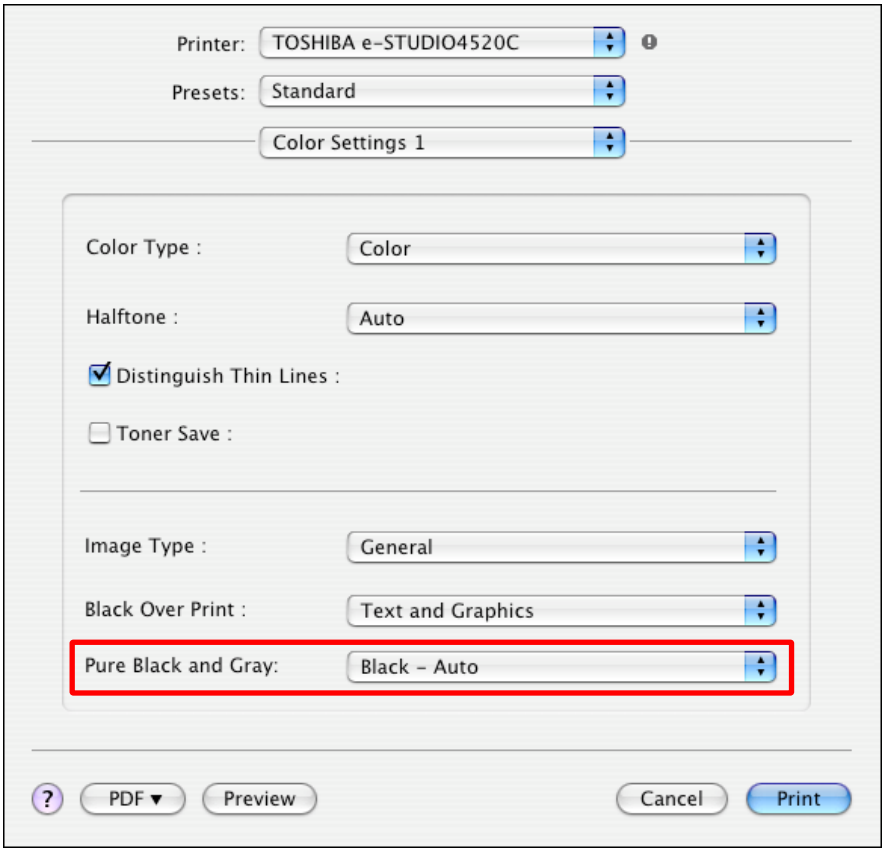
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "Black - Auto" from among the "Pure Black and Gray" options.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 2" ⇨ "Pure Black and Gray"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Pure Black and Gray"



❑ Precautions after the completion of the adjustment

The adjustment allows gray areas always to be reproduced using all color toners (C, M, Y and K). As a result, undesired colors may look blended, depending on the print image. Therefore, carefully perform the adjustment, while checking the printouts.

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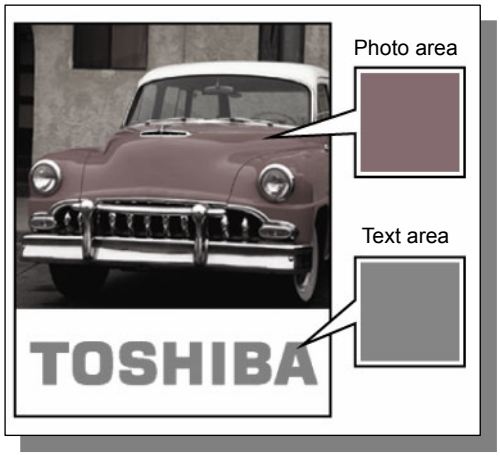
3.6 To Use Only the Black Toner to Reproduce Gray Areas

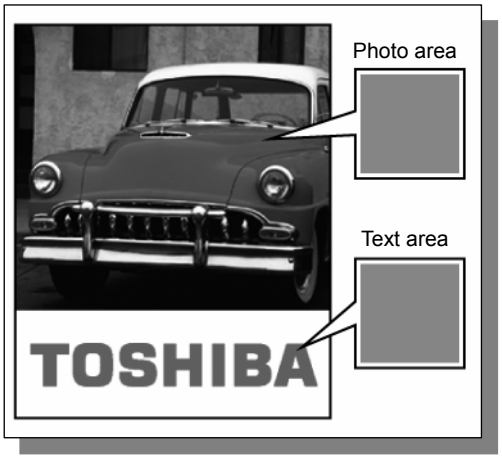
(To use only the black toner to reproduce black-and-white photos or gradational images)

Before the adjustment



Using all color toners to reproduce black-and-white photo images (bitmap data) blends undesired colors in the image.

After the adjustment



Using only the black toner to reproduce black-and-white photo images can diminish undesired colors.

❑ Explanation

For printing, only the K toner is usually used to reproduce gray areas of drawing data, lines and text. On the other hand, all color toners (C, M, Y and K) are used to reproduce gray areas of image data, such as BMP, GIF, JPEG and TIFF. This provides a deeper gray on the printouts.

The following are examples when image data are reproduced using C, M, Y and K:

- A gray-scale or black-and-white photo is pasted in photo editing software such as Imaging and Paint Shop Pro, in Internet Explorer, word-processing or spreadsheet software.
- A semi-transparent gray color or gradient of gray is used in the Format AutoShape dialog box on Microsoft Office.

  (The gray area printed out as raster data in the same manner as a photo image is reproduced using C, M and Y toners, or C, M, Y and K toners.)

Change the option on the printer driver, in order to use only the black toner to reproduce the gray area where C, M, Y and K are used as described above.

❑ Procedures

*Both the service technician and the user can perform all adjustments.

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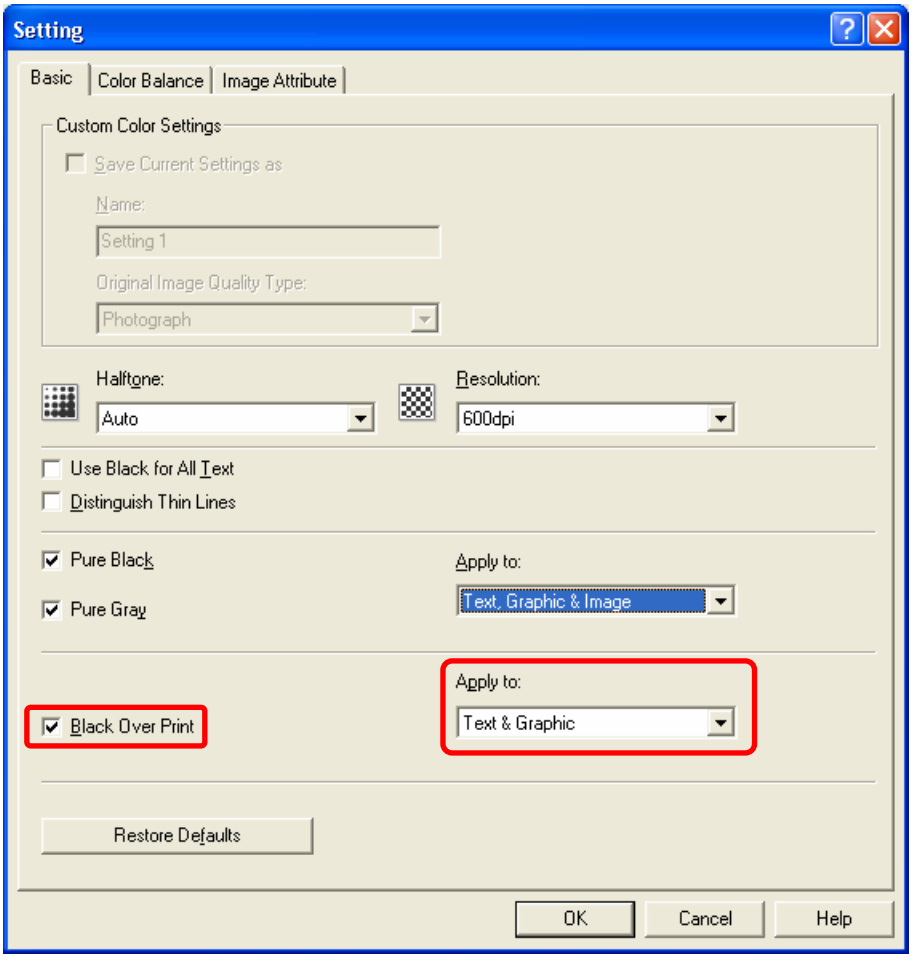
(1) Mark the "Pure Gray" checkbox on the printer driver. Select "Text, Graphic & Image" from among the "Apply to" options. ("Pure Gray" allows gray areas to always be reproduced using only the K toner without changing the hue of color areas.)

* This adjustment will be effective, only if a file created on a general application, such as Microsoft Office, is printed. It may not be effective, if a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress) is printed, or a PDF file created on these applications is printed.

For Windows

PCL6 PS3 * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.
Mark the "Pure Gray" checkbox in the "Basic" tab. Select "Text, Graphic & Image" from among the "Apply to" options.



	Apply to			
	Auto	Text	Text & Graphic	Text, Graphic & Image
Text	Black (K toner)	Black (K toner)	Black (K toner)	Black (K toner)
Graphic	Black (K toner)	Color (CMYK toner)	Black (K toner)	Black (K toner)
Image	Color (CMYK toner)	Color (CMYK toner)	Color (CMYK toner)	Black (K toner)

* The above table shows the sample combinations of when the Image Quality Type is “General”. When “Auto” is selected, the areas to be applied are automatically selected according to the Image Quality Type.

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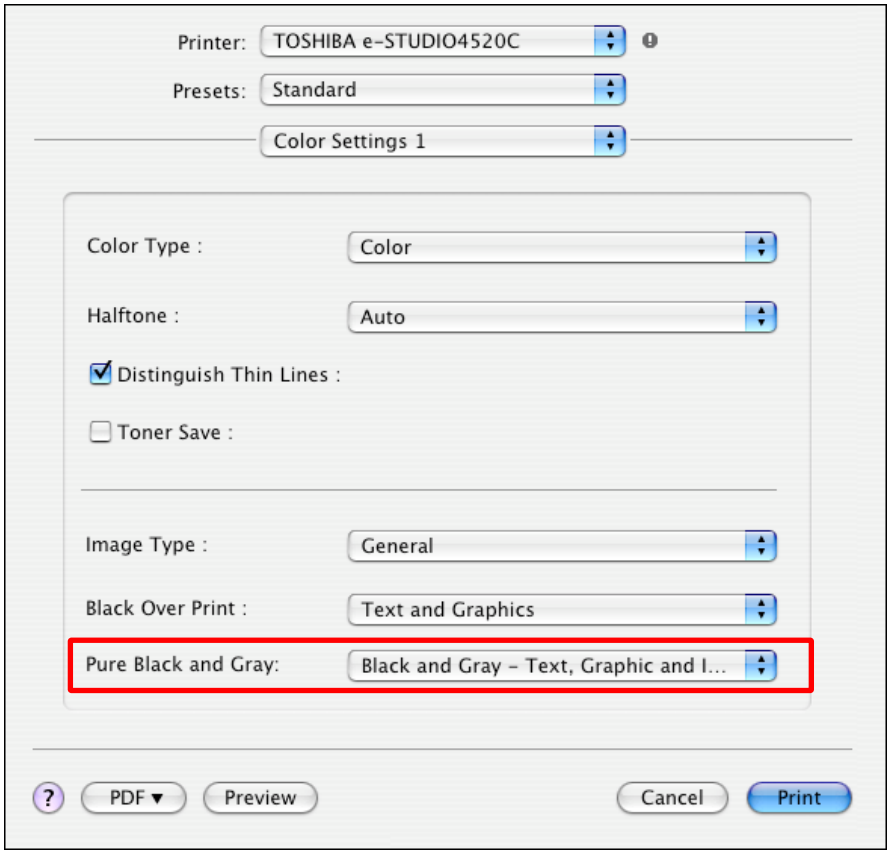
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "Black & Gray - Text, Graphic & Image" from among the "Pure Black and Gray" options.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 2" ⇨ "Pure Black and Gray"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Pure Black and Gray"



❑ Precautions after the completion of the adjustment

The adjustment allows gray areas to always be reproduced using only the K toner. As a result, color photos may look more grained. Therefore, carefully perform the adjustment, while checking the printouts.

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(2) Enter the adjustment mode [05]. Change the values for codes [8210] to [8212] and [8249] to [8254] to adjust the judgmental threshold for the "Pure Black and Gray" setting.

PDL	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
PS	Text	8252	0/1/2/3/4	Default	1 to 255	8/8/8/8/8
	Graphics	8253	0/1/2/3/4	Default	1 to 255	1/1/1/8/1
	Image	8254	0/1/2/3/4	Default	1 to 255	1/1/1/8/1
PCL	Text	8210	0/1/2/3	Default	1 to 255	8/8/8/8
	Graphics	8211	0/1/2/3	Default	1 to 255	1/1/1/8
	Image	8212	0/1/2/3	Default	1 to 255	1/1/1/8
XPS	Text	8249	0/1/2/3/4	Default	1 to 255	8/8/8/8/8
	Graphics	8250	0/1/2/3/4	Default	1 to 255	1/1/1/8/1
	Image	8251	0/1/2/3/4	Default	1 to 255	1/1/1/8/1

Subcode	Image Quality Type
0	General
1	Photograph
2	Presentation
3	Line Art
4	Advanced

* If the default value is "1", change the "Pure Black and Gray" setting to "Off" on the Color Settings menu of printer driver since no value smaller than 1 is provided.
When "Text, Graphic & Image" is selected for the "Apply to" setting on the printer driver setting menu, photo areas whose colors are close to black may be treated as black because the larger the value is, the wider the area to be printed only with K toner becomes. Therefore adjust the value carefully while checking the copied image.

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3.7 To Easily Adjust the Overall Brightness

Before the adjustment

The image is printed with a natural brightness.
(Default printing)

After the adjustment

A darker print image is obtained.

After the adjustment

A brighter print image is obtained.

❑ Explanation

The brightness of the print image can be easily adjusted by changing the "Brightness" setting on the printer driver.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

(1) Change the "Brightness" option on the printer driver.

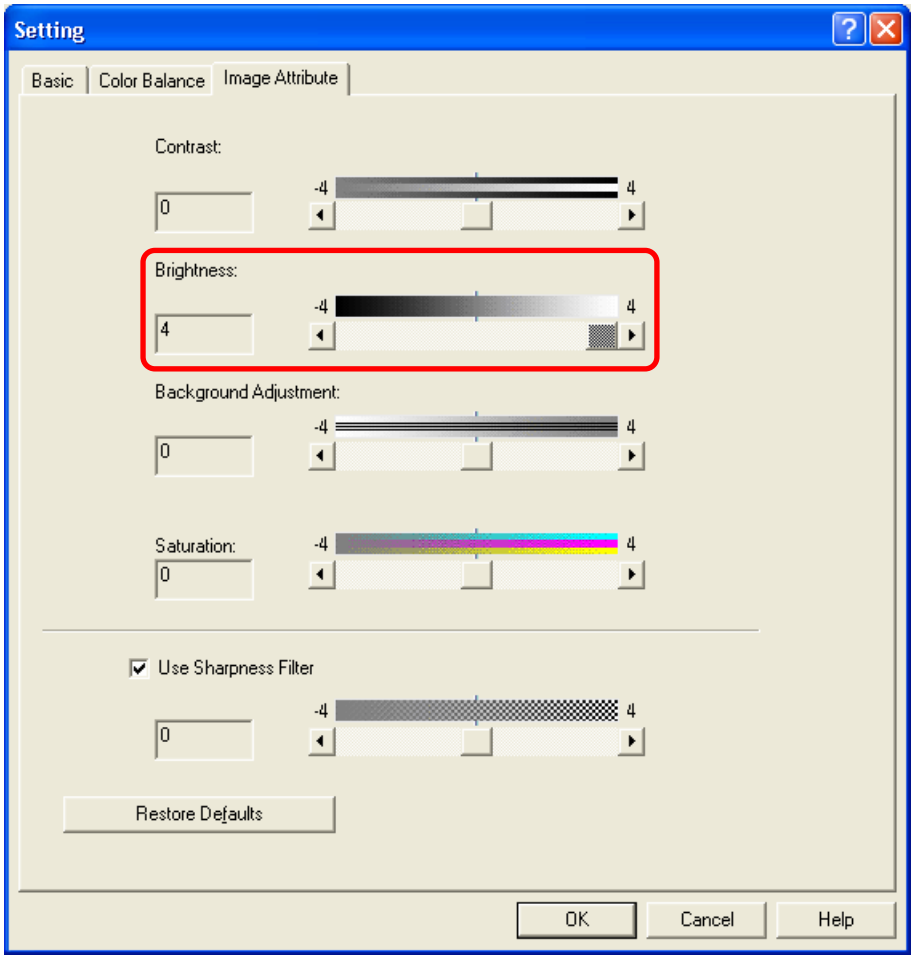
• Select the desired value for brightness on a scale of -4 (Darkest) to 4 (Lightest).

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Change the "Brightness" option in the "Image Attribute" tab.



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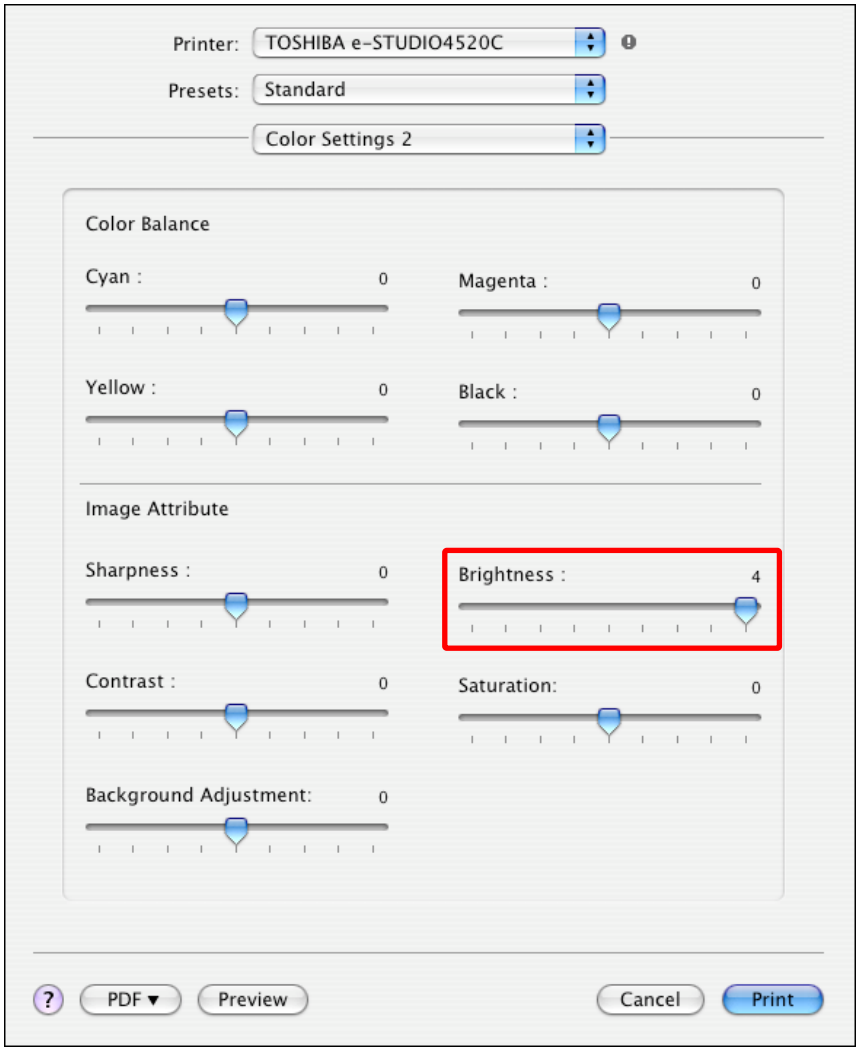
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Change the "Brightness" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Brightness"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Brightness"



❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

The brightness adjustment does not affect black text (CMY = 100%, K = 100% or RGB = 0%).

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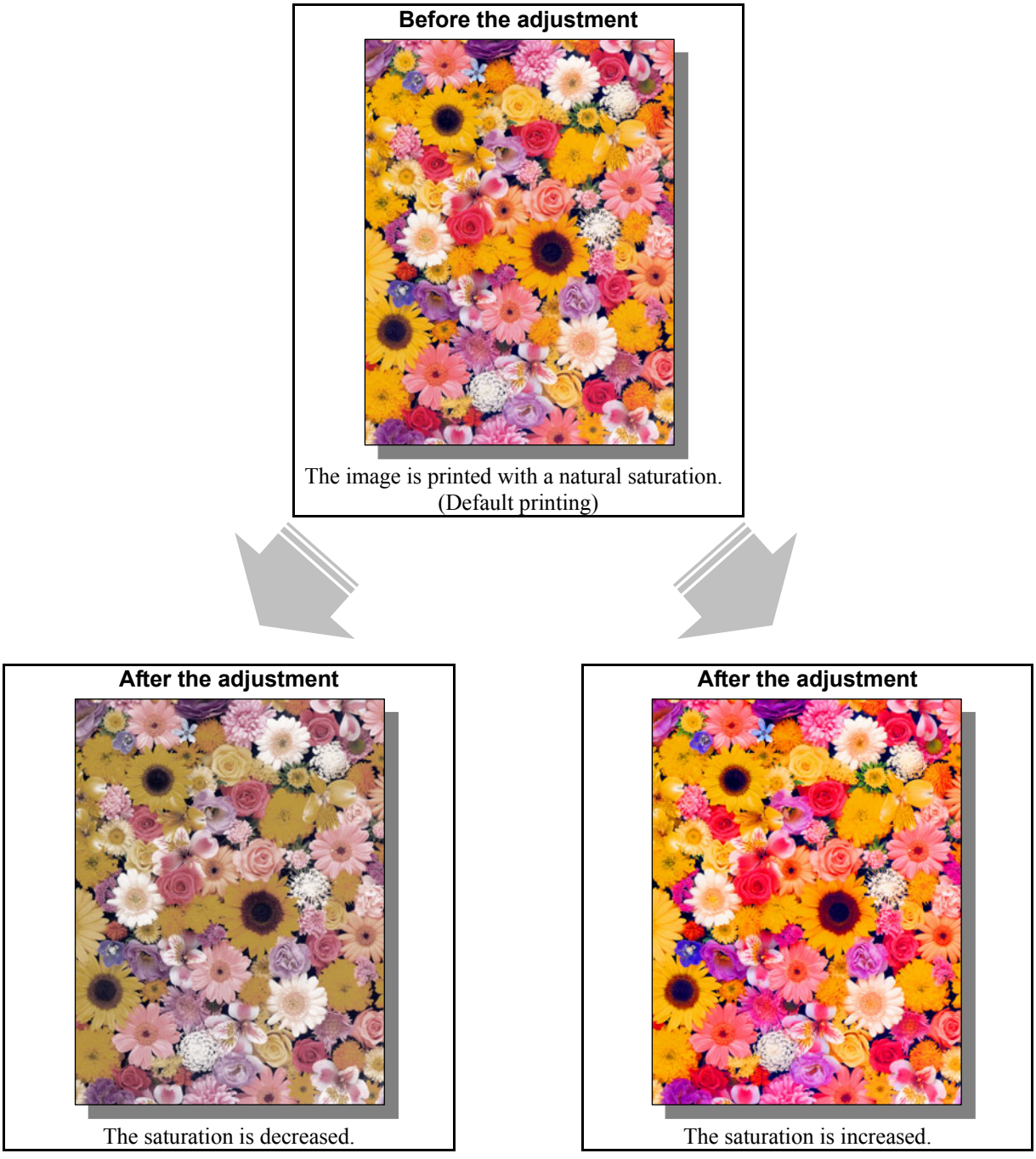
3.8 To Adjust the Overall Saturation



❑ Explanation

The saturation of the print image can be easily adjusted by changing the "Saturation" option on the printer driver.

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❑ Procedures

*Both the service technician and the user can use procedure (1).

*Only if the saturation of R (Red) is still insufficient even after procedure (1) has been used, must the service technician use procedure (2).

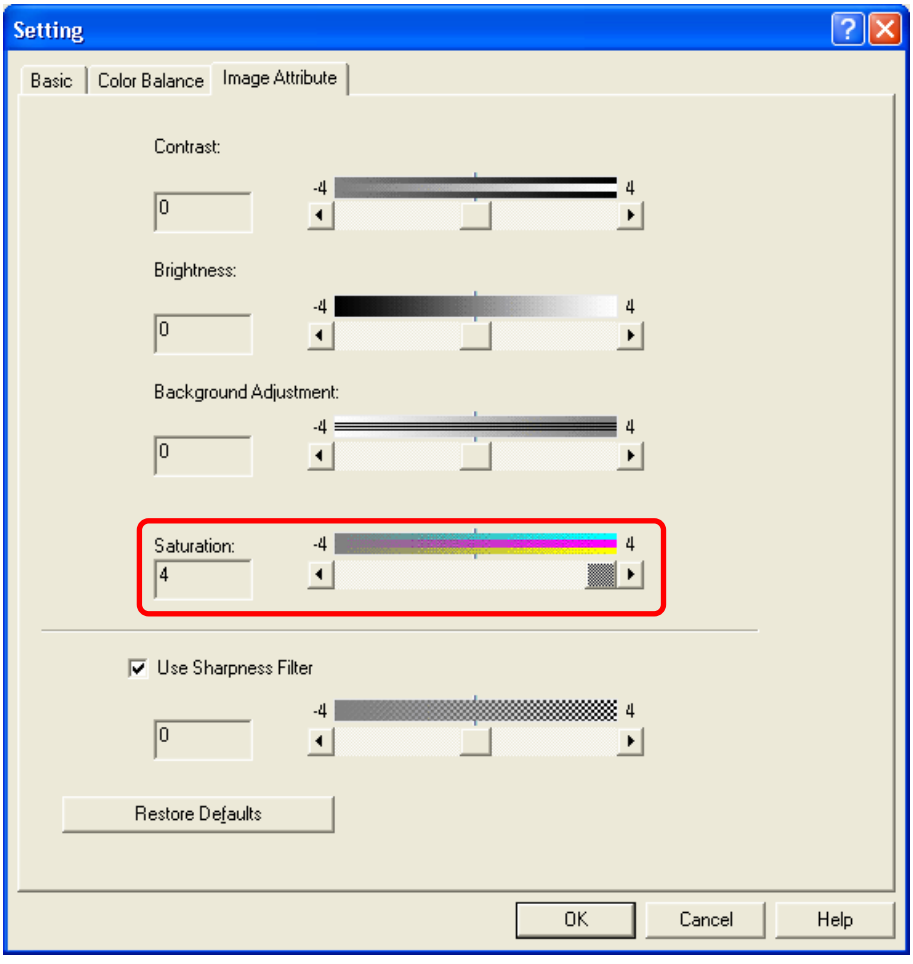
(1) Change the "Saturation" option on the printer driver.

• Select the desired value for saturation on a scale of -4 (Palest) to 4 (Brightest).

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.
Change the "Saturation" option in the "Image Attribute" tab.



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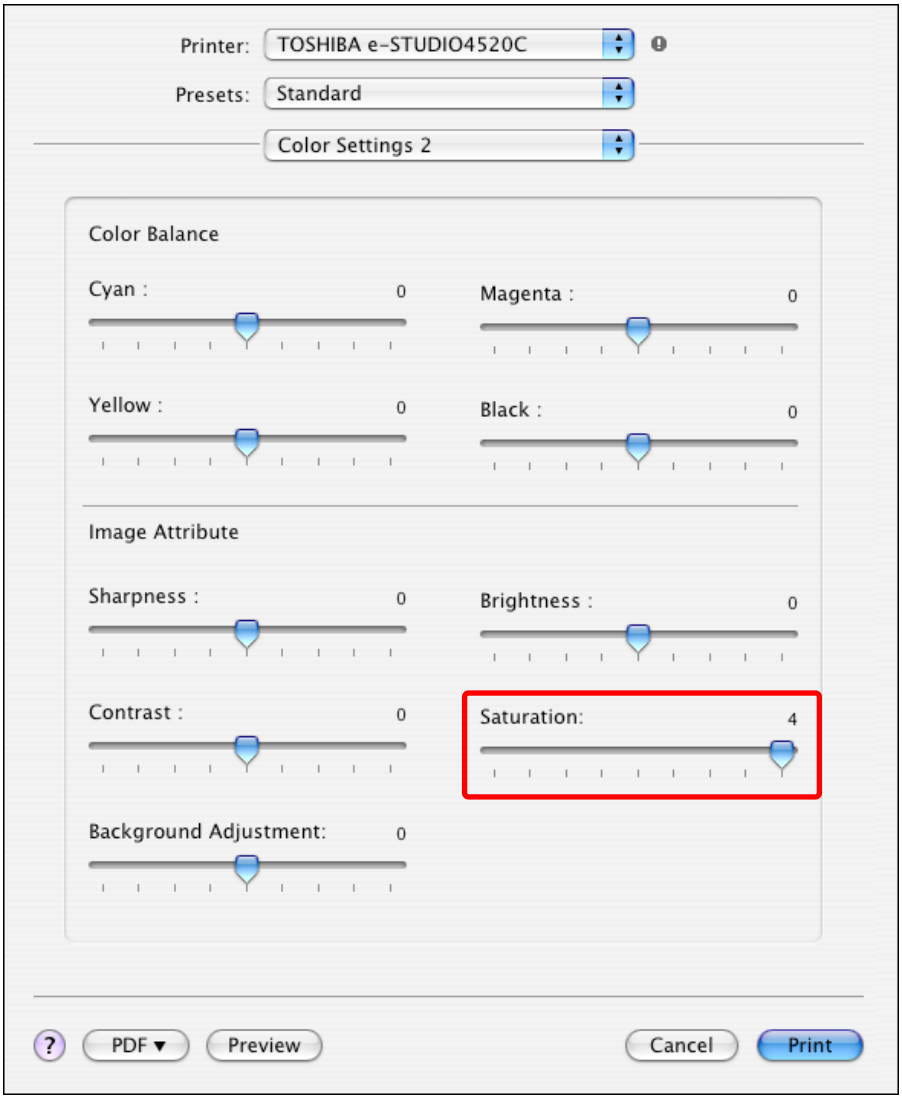
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Change the "Saturation" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Saturation"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Saturation"



After changing the option on the printer driver, print and check the print image quality.

Only if the saturation of R (Red) is still insufficient even after all the above procedures have been used, must the service technician use the next procedure.

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(5) Enter adjustment mode [05]. Change the value for code [2905] to adjust the transfer (1st transfer) roller bias output.
(Adjust the offset voltage of the transfer roller bias for C (Cyan) and K (Black) so as to increase the density of R (Red).)

• The code to use varies according to the paper type and color to adjust. Adjust the value for the subcode corresponding to the color for which you would like to improve the image quality. Set the value within a range of "2" to "5" to obtain the highest density of R (Red).

Paper type	Color to adjust	[05] code	Subcode	Recommended value	Acceptable value range	Default
Plain paper	C (Cyan)	05-2905	2	2 to 5	0 to 10	5
	K (Black)		3			
Thick	C (Cyan)		8			
	K (Black)		9			

*Never change the values for subcodes other than the above. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

<Note>
- The adjustment may possibly decrease the density of G (Green), B (Blue) and K (Black) extremely. Therefore, carefully perform the adjustment, while checking the printout.
- Unless this adjustment changes the density of R (Red), return the values to the default (set value: 5).
- This adjustment may affect not only the printouts but also every type of image quality such as the copy image. Therefore, perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

The saturation adjustment does not affect black or gray areas on the printout.

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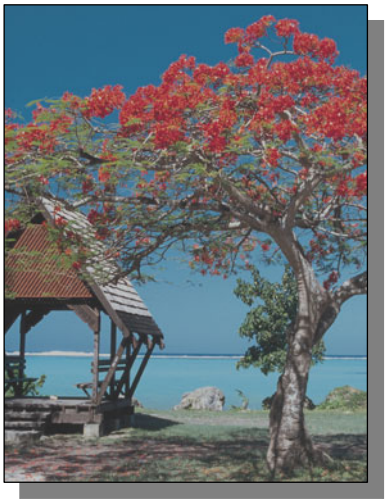
3.9 To Easily Adjust the Overall Contrast

Before the adjustment

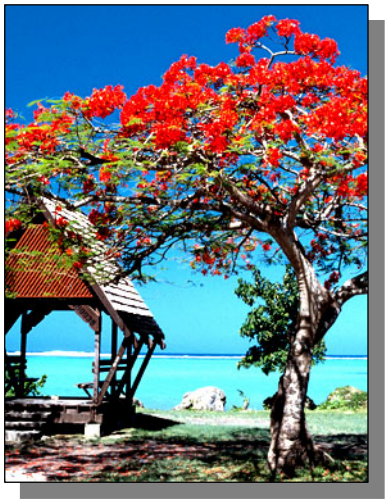
The image is printed with a natural contrast.
(Default printing)

After the adjustment



The contrast is decreased.

After the adjustment



The contrast is increased.

❑ Explanation

The contrast of the print image can be easily adjusted by changing the "Contrast" option on the printer driver.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

(1) Change the "Contrast" option on the printer driver.

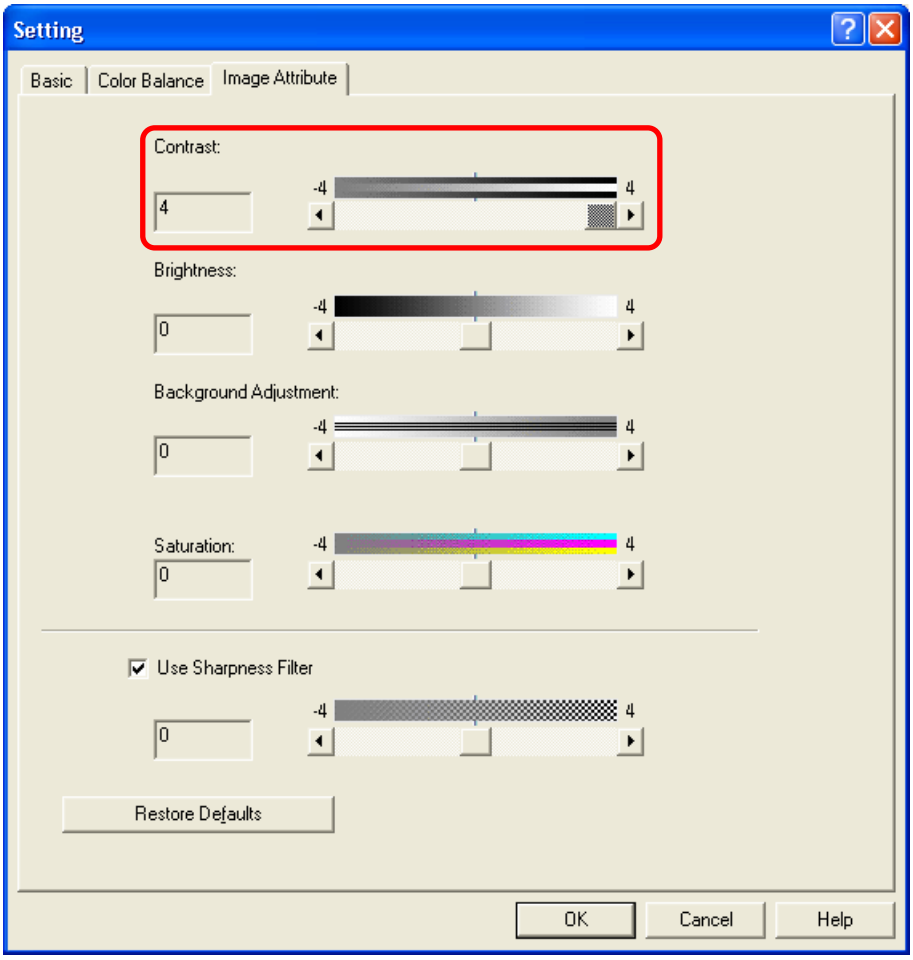
• Select the desired value for contrast on a scale of -4 (Lowest) to 4 (Highest).

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Change the "Contrast" option in the "Image Attribute" tab.



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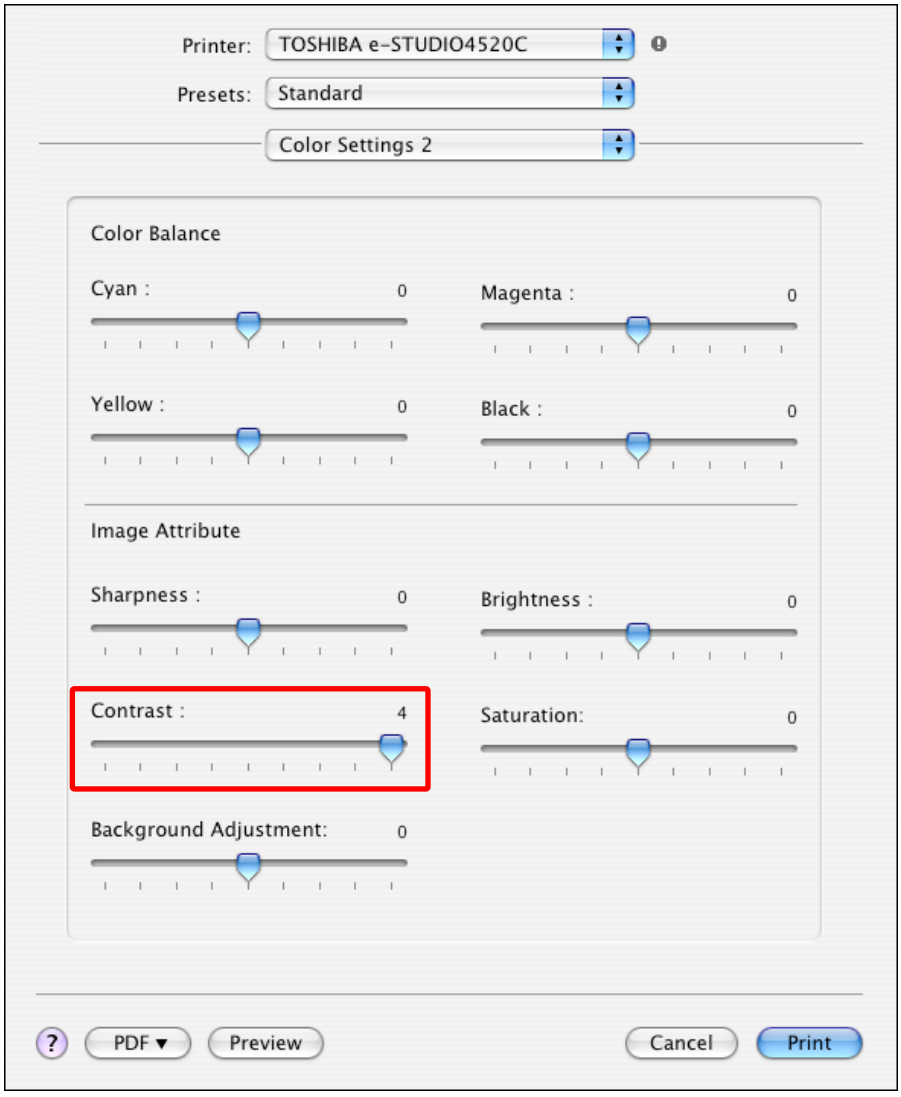
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Change the "Contrast" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Contrast"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Contrast"



❑ Precautions after the completion of the adjustment

Nothing in particular.

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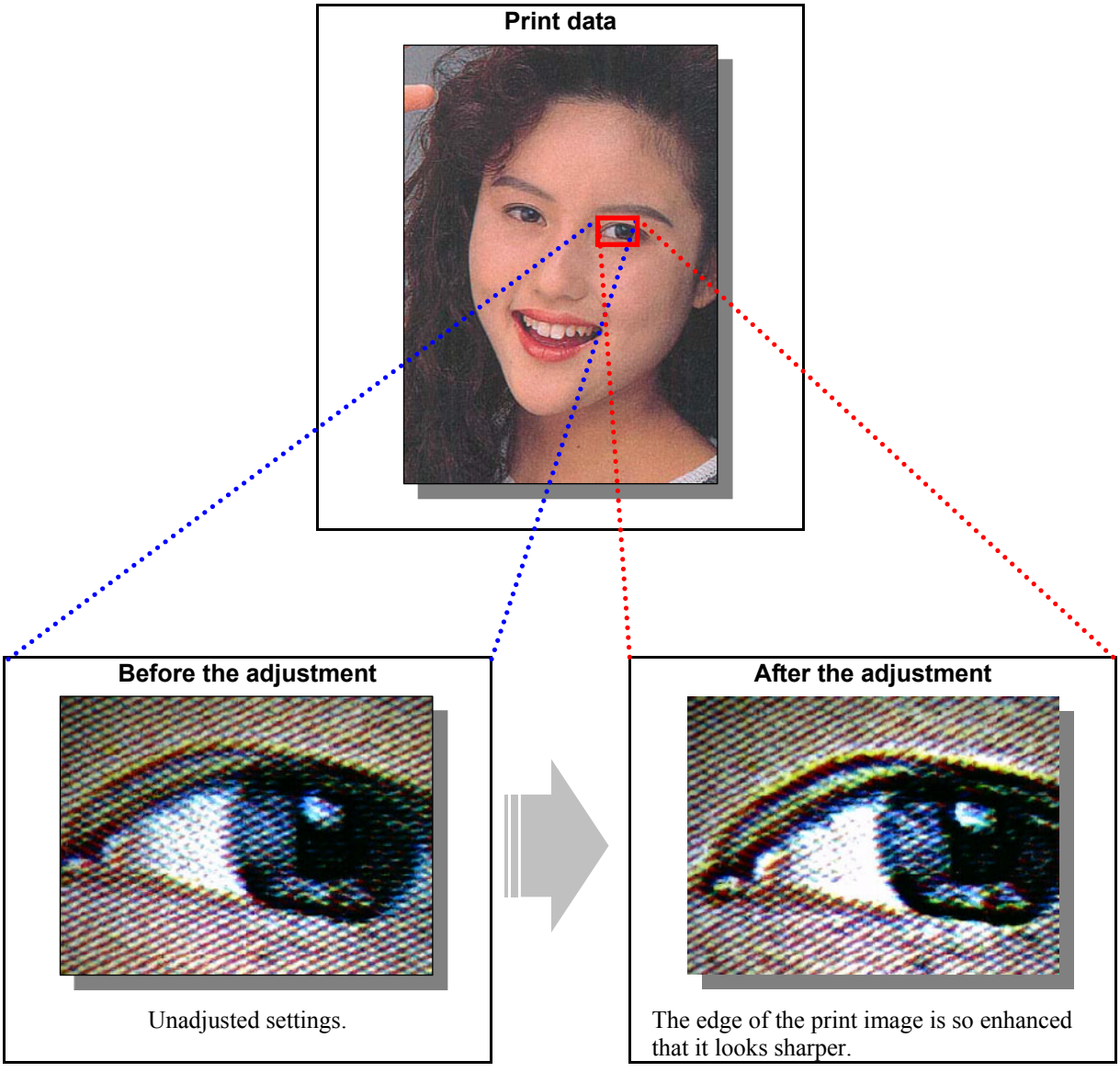
3.10 To Obtain a Sharper Print Image


Print data
Before the adjustment
Unadjusted settings.
After the adjustment
The edge of the print image is so enhanced that it looks sharper.

❑ Explanation

Increase the sharpness intensity under the menu on the printer driver, in order to obtain a sharper print image.

* The sharpness adjustment will have an effect particularly on photo images, such as BMP, GIF, JPEG and TIFF.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

(1) Change the "Sharpness" option on the printer driver.

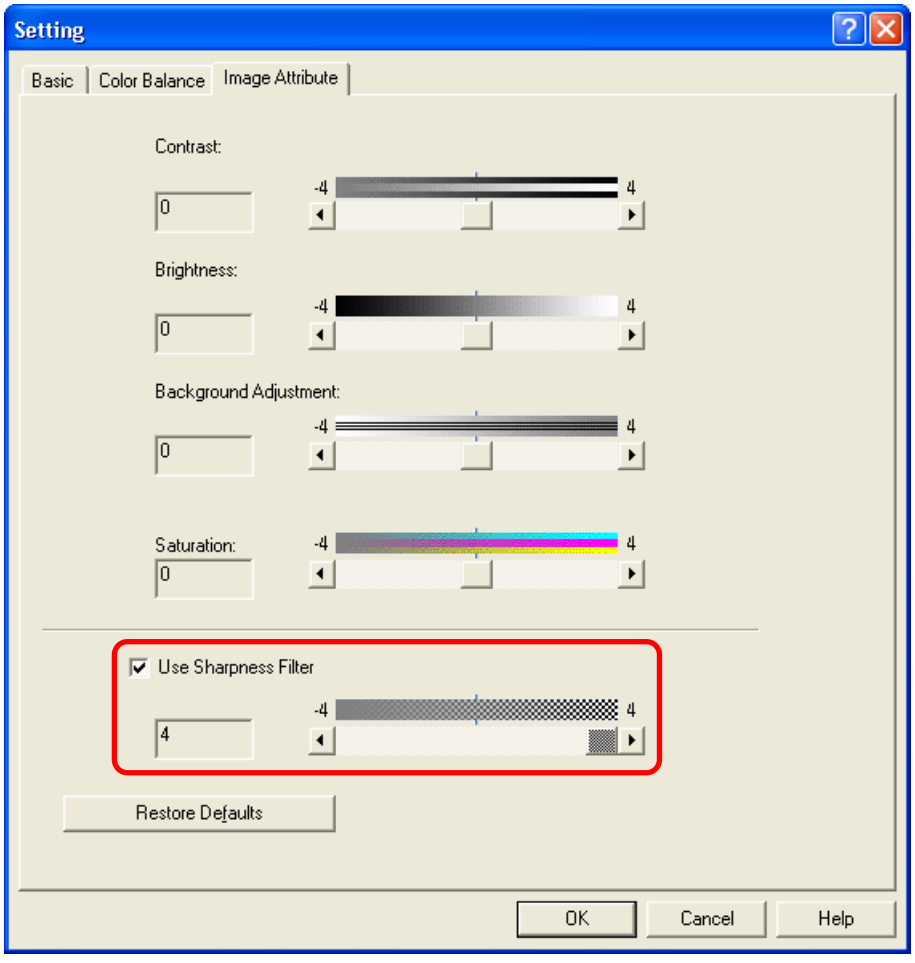
For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Set the value for "Sharpness" within a range of "1" to "4" in the "Image Attribute" tab.

• Setting "4" provides the sharpest print image.



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For Macintosh

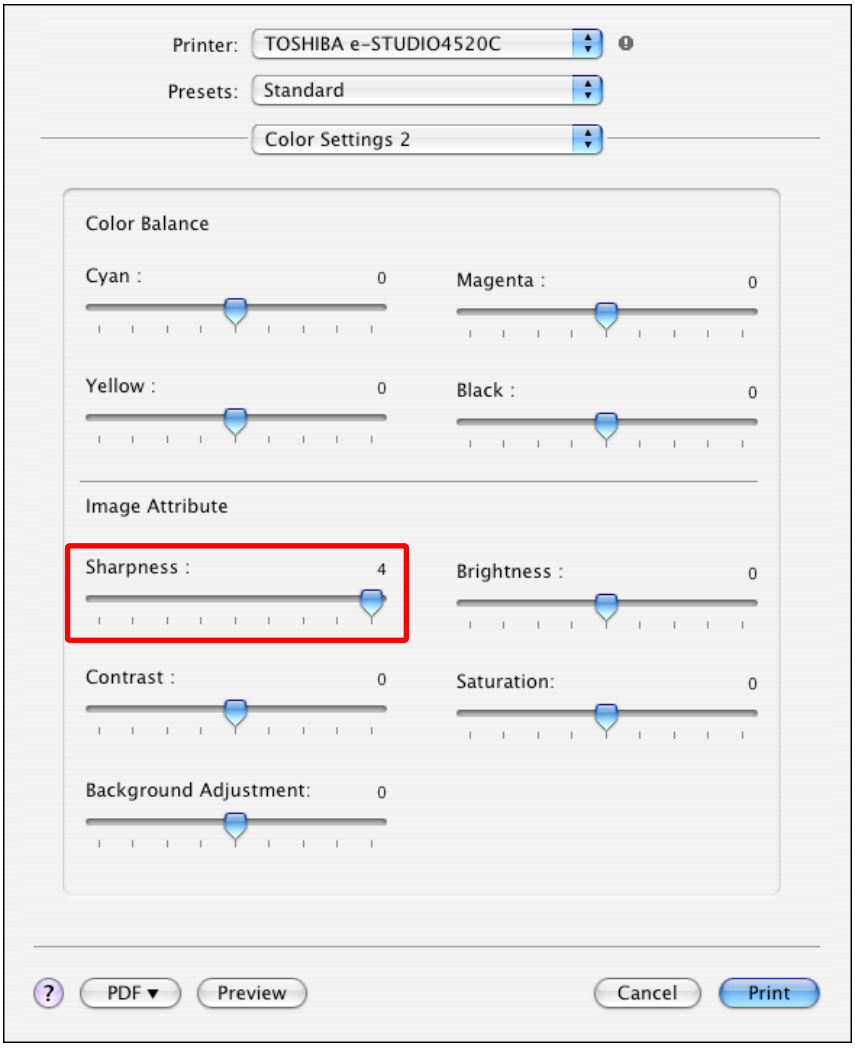
Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Set the value for "Sharpness" within a range of "1" to "4."

• Setting "4" provides the sharpest print image.

*The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Sharpness"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Sharpness"



❑ Precautions after the completion of the adjustment

The adjustment may possibly cause rough edges of the image contained in low-resolution bitmap data. As a result, outlined edges may look shaded, black bands may appear, and toner may be scattered around the lines. Therefore, carefully perform the adjustment, while checking the printouts.

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3.11 To Obtain a Softer Image

❑ Explanation

Decrease the sharpness intensity under the menu on the printer driver, in order to obtain a softer print image.

* The sharpness adjustment will have an effect particularly on photo images, such as BMP, GIF, JPEG and TIFF.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

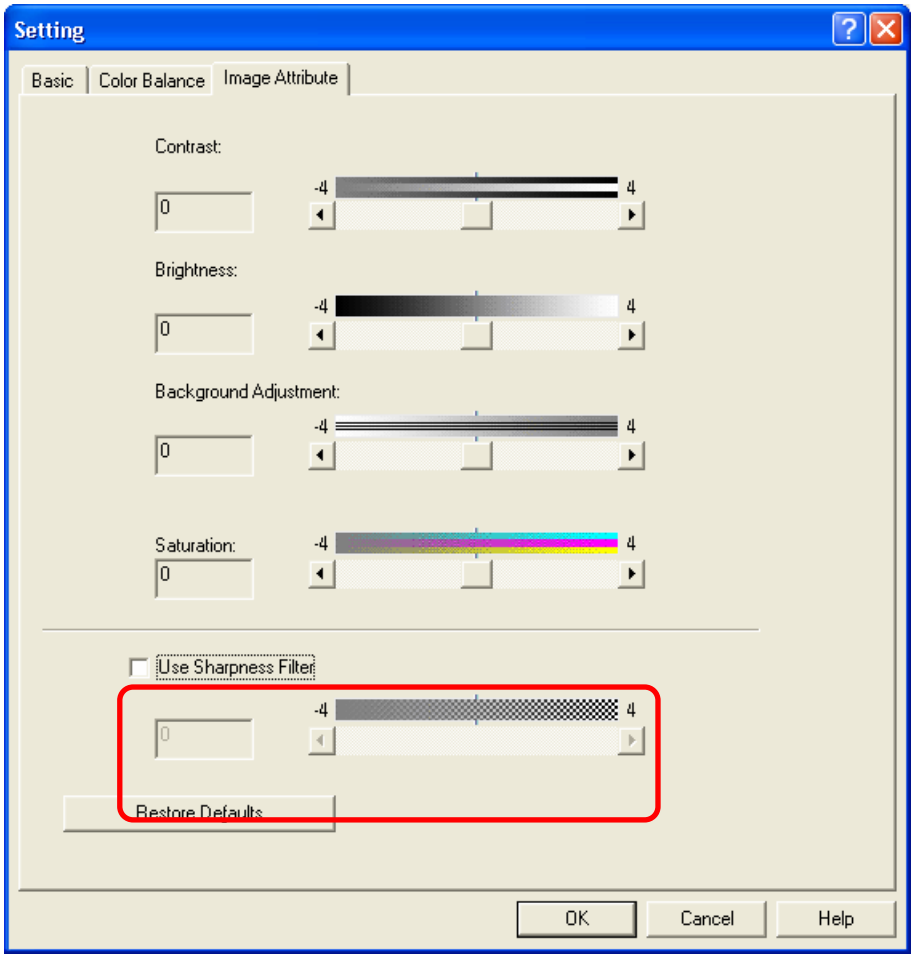
(1) Change the "Sharpness" option on the printer driver.

For Windows

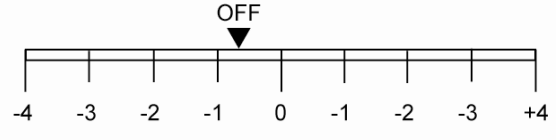
PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab. Uncheck the "Use Sharpness Filter" checkbox in the "Image Attribute" tab. To make a softer image, check its checkbox and then set the value within a range of "-1" to "-4."

• Setting "-4" provides the smoothest (softest) image.



The value "OFF" of sharpness intensity adjustment is positioned as shown below.



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For Macintosh

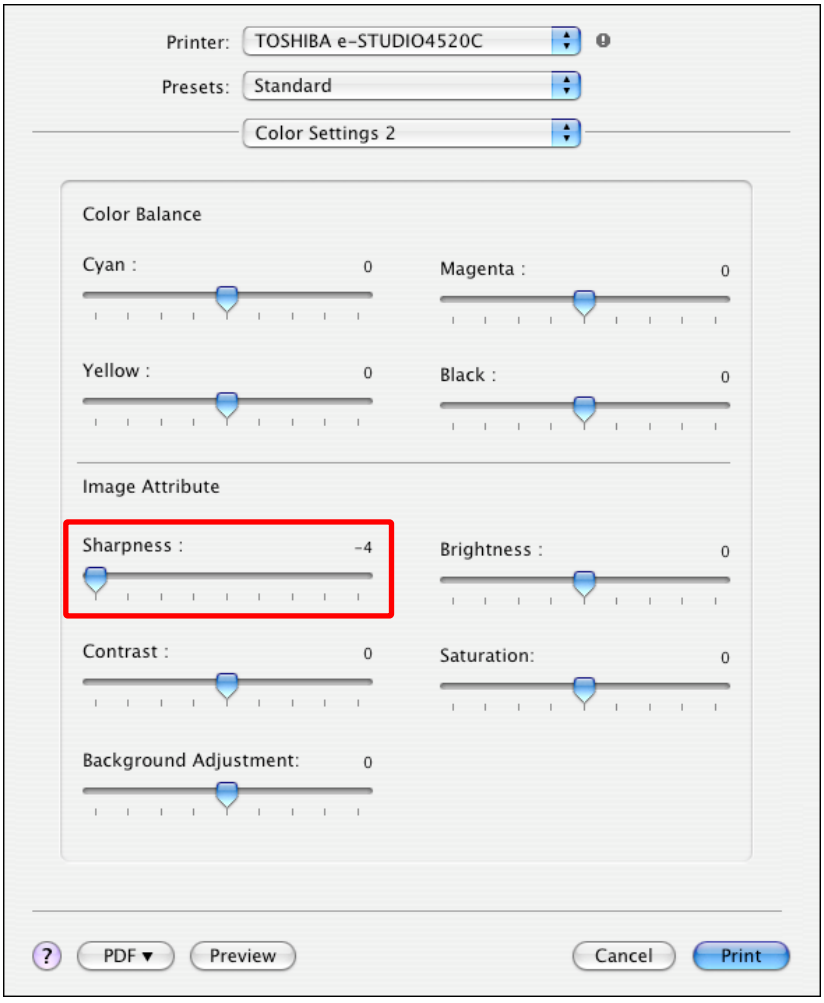
Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Set the value for "Sharpness" within a range of "-1" to "-4."

• Setting "-4" provides the smoothest (softest) print image.

*The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Sharpness"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Sharpness"



❑ Precautions after the completion of the adjustment

The adjustment provides a soft or blurred image in general. Therefore, carefully perform the adjustment, while checking the printouts. Especially text and lines on the background of a gradational image, and text in the Format AutoShape dialog box with transparency selected on Microsoft Office may be blurred.

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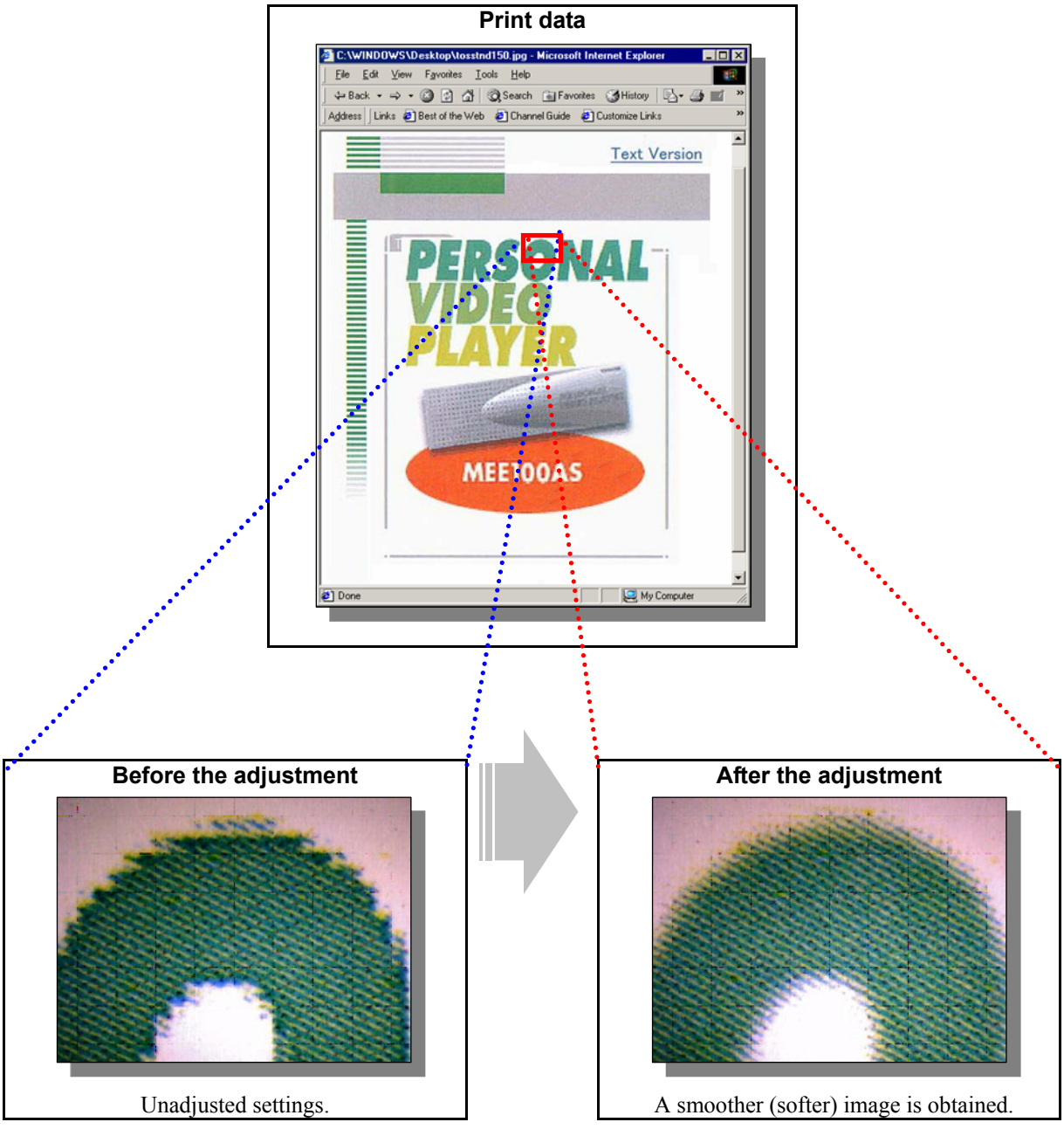
3.12 To Make Low-resolution Data Look Finer (To soften an image)



❑ Explanation

When a low-resolution image is printed, the edges may be jagged. Decrease the sharpness intensity, in order to eliminate the jaggies from the print image.

* The sharpness adjustment will have an effect particularly on photo images, such as BMP, GIF, JPEG and TIFF.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

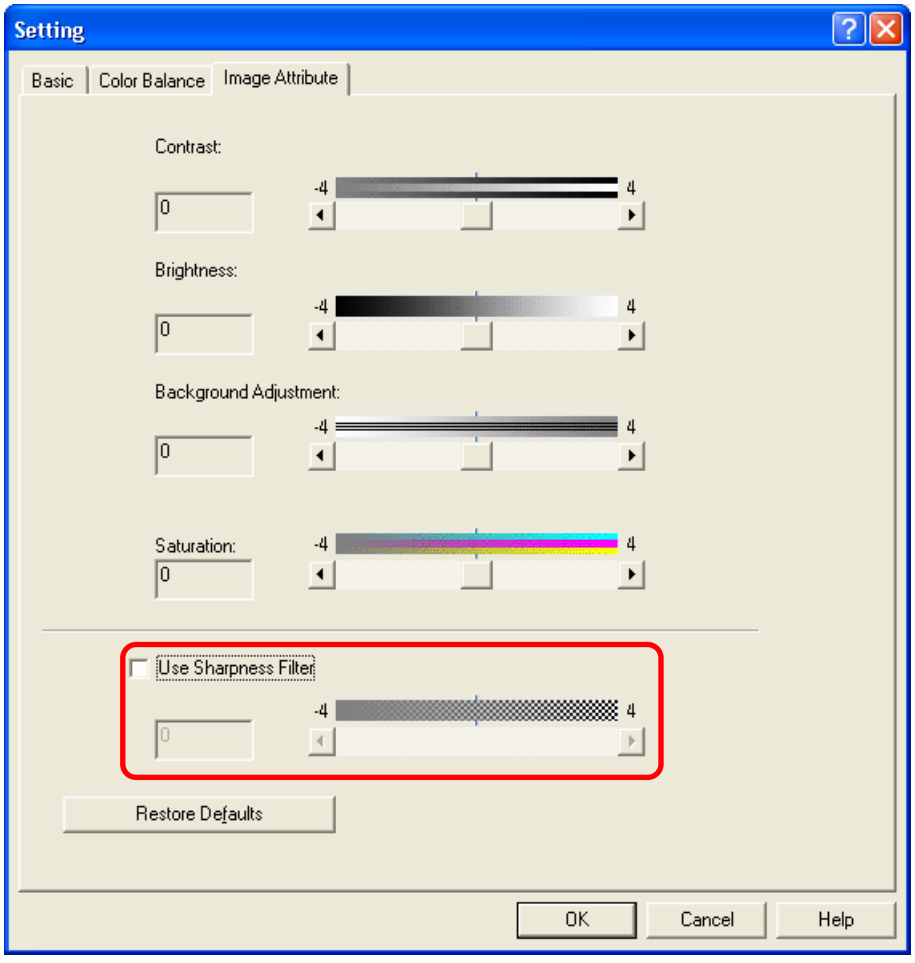
(1) Change the "Sharpness" option on the printer driver.

For Windows

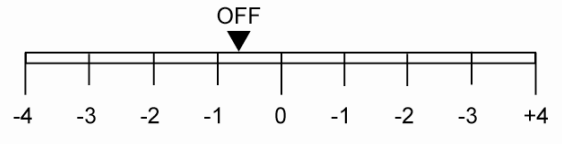
PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab. Uncheck the "Use Sharpness Filter" checkbox in the "Image Attribute" tab. To make a smoother image, check its checkbox and then set the value within a range of "-1" to "-4."

• Setting "-4" provides the smoothest (softest) print image.



The value "OFF" of sharpness intensity adjustment is positioned as shown below.



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For Macintosh

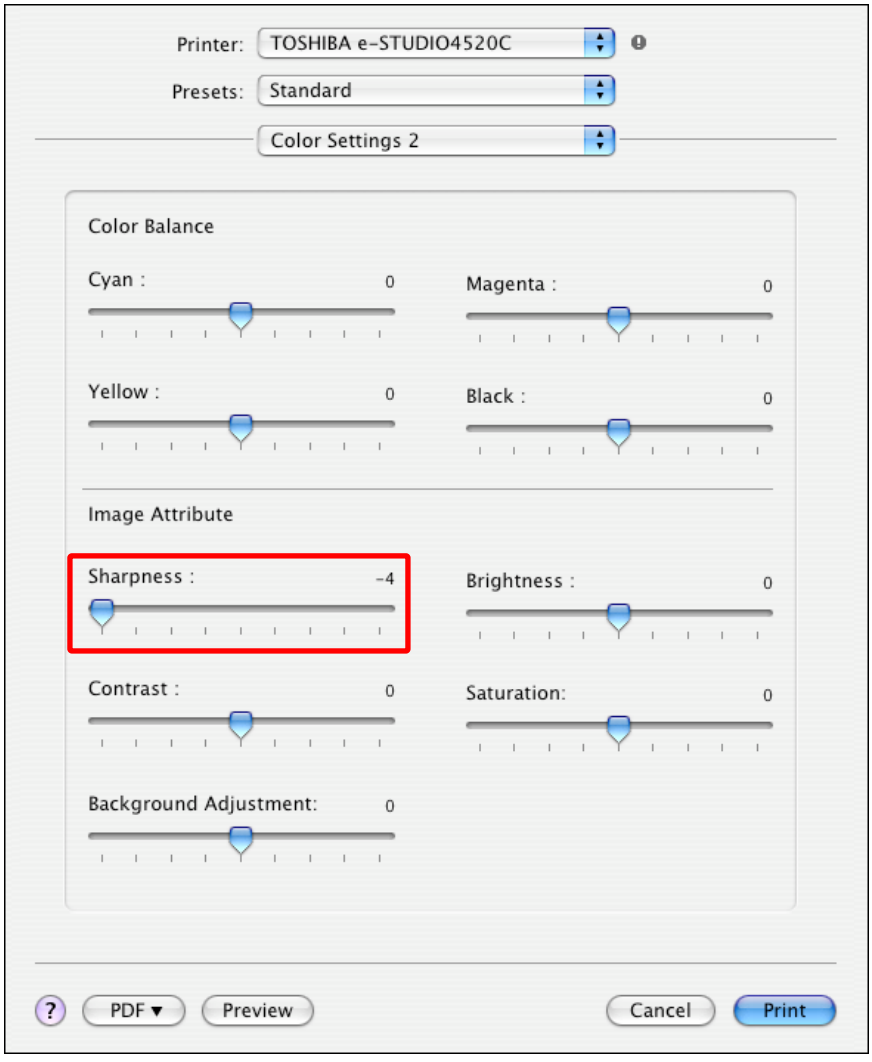
Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Set the value for "Sharpness" within a range of "-1" to "-4."

• Setting "-4" provides the smoothest (softest) print image.

*The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Sharpness"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Sharpness"



❑ Precautions after the completion of the adjustment

The adjustment provides a soft or blurred image in general. Therefore, carefully perform the adjustment, while checking the printouts. Especially text and lines on the background of a gradational image, and text in the Format AutoShape dialog box with transparency selected on Microsoft Office may be blurred.

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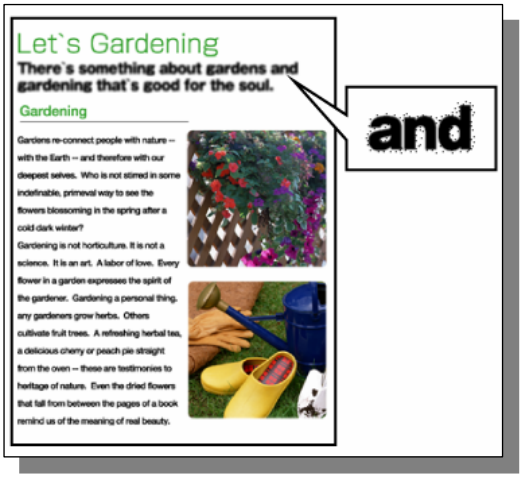
3.13 To Eliminate Smudges from Highly Colored Text and Lines

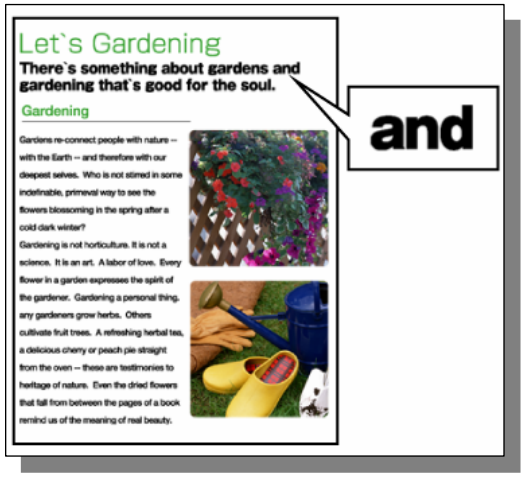
(To prevent toner scattering around text and lines where a large amount of toner is used)

Before the adjustment



Black text looks smudged due to toner scattering around the text.

After the adjustment



Smudges are eliminated.

❑ Explanation

When highly colored text and lines where a large amount of toner is used, created on raster data (image), such as BMP, GIF, JPEG and TIFF are printed, the text and lines look smudged due to toner scattering around the text and lines. Adjust the sharpness intensity or the amount of toner used, in order to obtain a clearer print image.

<Hint> If smudged text and lines appear on the print image in PDF format on Adobe Reader, unmark the "Print as image" checkbox to print out the image. If the "Print as image" checkbox is marked, text and lines will be printed as raster data (bitmap image) and may be smudged.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Both the service technician and the user can perform the adjustment for Windows.
* Only the service technician can perform the adjustment for Macintosh.

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(1) Change the "Use Sharpness Filter" option on the printer driver.

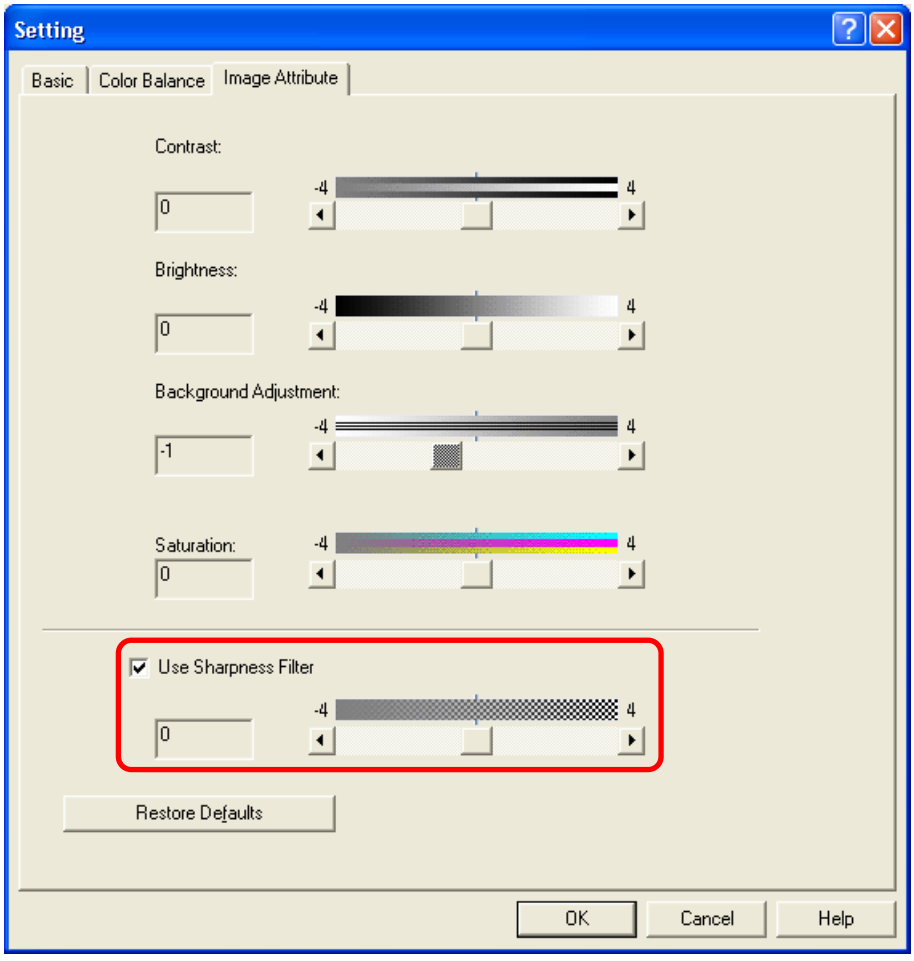
For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Uncheck the "Use Sharpness Filter" checkbox in the "Image Attribute" tab.

* Always set "Uncheck". Setting "-1" or a smaller value may provide blurred print images.



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For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Enter the adjustment code [05]. Change the values for codes [8110] to [8113] and [8118] to "0" to change the sharpness setting OFF.

Color mode	Image quality type	[05] code	Subcode	Recommended value	Acceptable value range	Default
Auto/Color	General	05-8110	0/1/2	Change the value to 0.	0 to 255	128
	Photo	05-8111	0/1/2			
	Presentation	05-8112	0/1/2			
	Line art	05-8113	0/1/2			
	Black	05-8118	0/1/2			

Subcode	Original
0	Text
1	Graphics
2	Image

<Note>

When the value of this code is changed, the sharpness setting of Windows is also changed to OFF.

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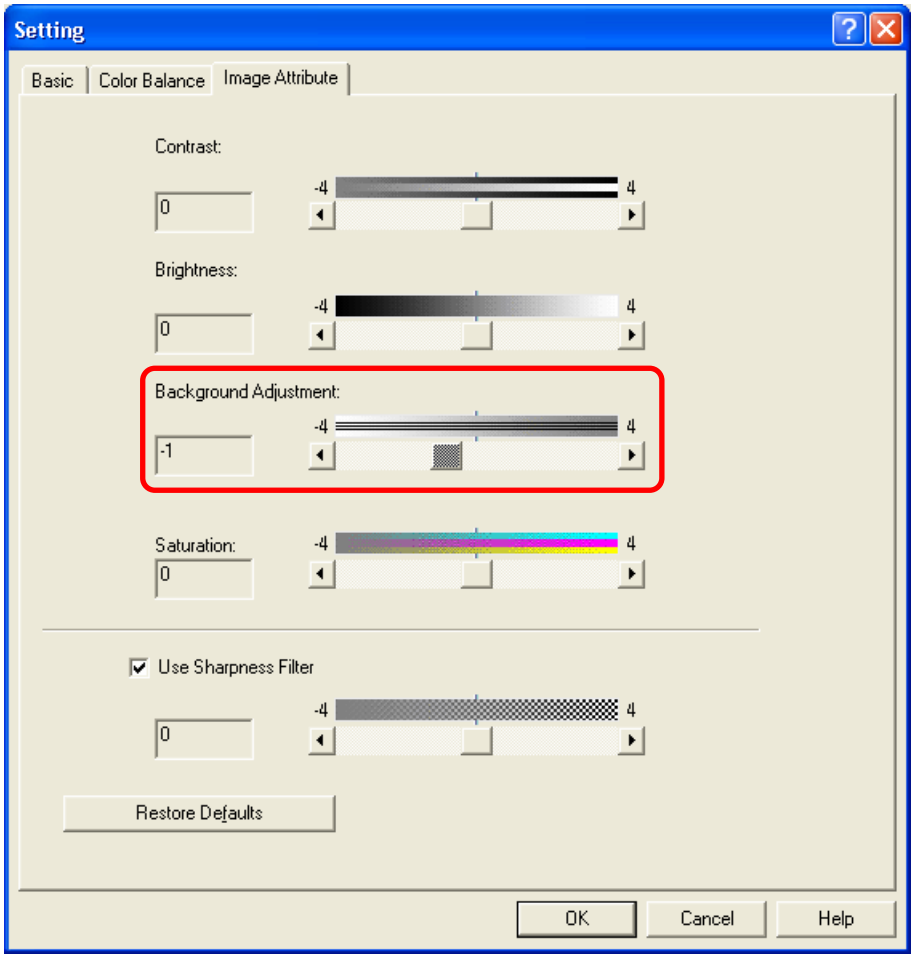
(2) Change the "Background adjustment" option on the printer driver.

For Windows

PCL6 PS3 XPS *This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver and press [Setting] button in the "Image Quality" tab. And then set the "Background Adjustment" option in the "Image Attribute" tab within the range of "-1" to "-4".



❑ Precautions after the completion of the adjustment

• The adjustment in procedure (1) may possibly provide insufficient photo contrast images. Therefore, carefully perform the adjustment, while checking the printouts.

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3.14 To Clearly Print Light-Colored Thin Lines or Text

Before the adjustment

Five Storied Pagoda
Gate
Toshogu Shrine
Monorail
Restaurant Seiyoken
Gojoten Shrine
Keisei Line
Shinobazu Pond
Boat House
Benzaiten Temple
Relocation Issues and Trends
By 2047, the melting of polar ice will force general commercial relocation to higher ground, with climatic fluctuations mediating the trend. On a national basis, there will be extensive investment in the development of infrastructures in areas unlikely to be affected by rising sea levels. The strengthening of network infrastructures will be of particular importance, particularly to the success or failure of commercial or industrial enterprises.
800
700
600
500
400
300
200
100
0
Country-A
Country-B
Country-C
Country-D
2044 2045 2046 2047 2048 2049 2050
Relocation to higher ground depends on climatic trends.

Light-colored thin lines and text are dotted on the printout.

After the adjustment

Five Storied Pagoda
Gate
Toshogu Shrine
Monorail
Restaurant Seiyoken
Gojoten Shrine
Keisei Line
Shinobazu Pond
Boat House
Benzaiten Temple
Relocation Issues and Trends
By 2047, the melting of polar ice will force general commercial relocation to higher ground, with climatic fluctuations mediating the trend. On a national basis, there will be extensive investment in the development of infrastructures in areas unlikely to be affected by rising sea levels. The strengthening of network infrastructures will be of particular importance, particularly to the success or failure of commercial or industrial enterprises.
800
700
600
500
400
300
200
100
0
Country-A
Country-B
Country-C
Country-D
2044 2045 2046 2047 2048 2049 2050
Relocation to higher ground depends on climatic trends.

The light-colored thin lines and text are clearly printed out.

❑ Explanation

When light-colored thin lines and text are printed, they may be dotted on the printout. Change the options on the printer driver, adjust the color balance or gamma curve balance, in order to print them out clearly.

❑ Procedures

* The procedure to use varies, depending on whether to adjust the print image quality in the Color mode or in the Black and White mode. Refer to the procedure corresponding to the user's particular request.

* The item to set varies depending on the type of data to adjust. Select the effective option according to the data format to adjust, such as a print image (raster data), text (font), and line drawing (graphic data).

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3.14.1 To Adjust the Print Image Quality in the Color Mode

*Perform the adjustment in accordance with the procedures below.
*Both the service technician and the user can use procedures (1), (2), and (3).
*Only the service technician must use procedures (4) and (5).

(1) Change the "Image Quality Type" and "Halftone" options.

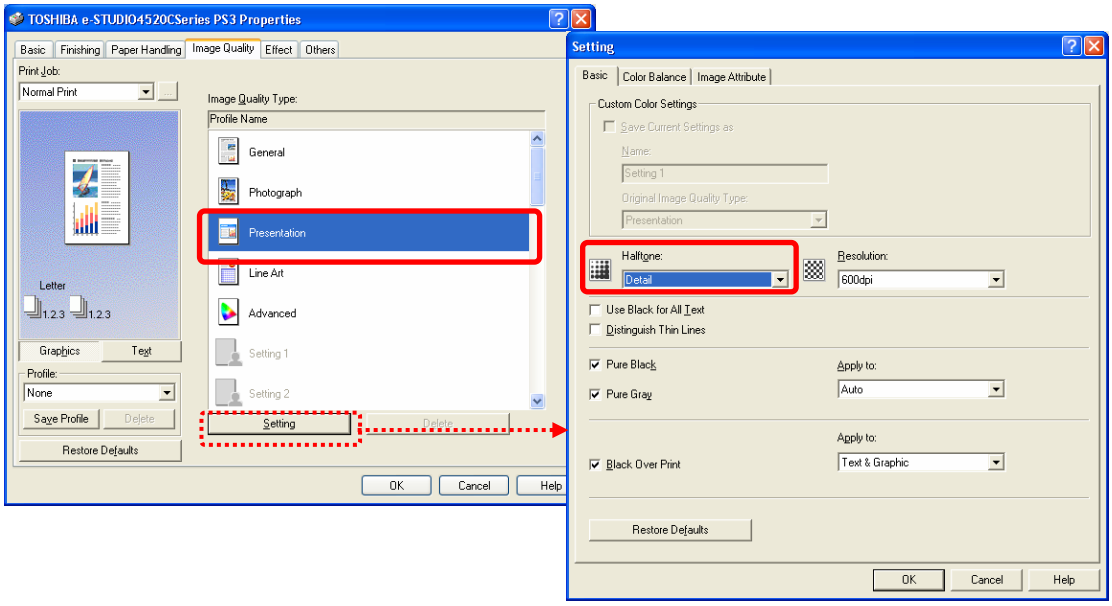
For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

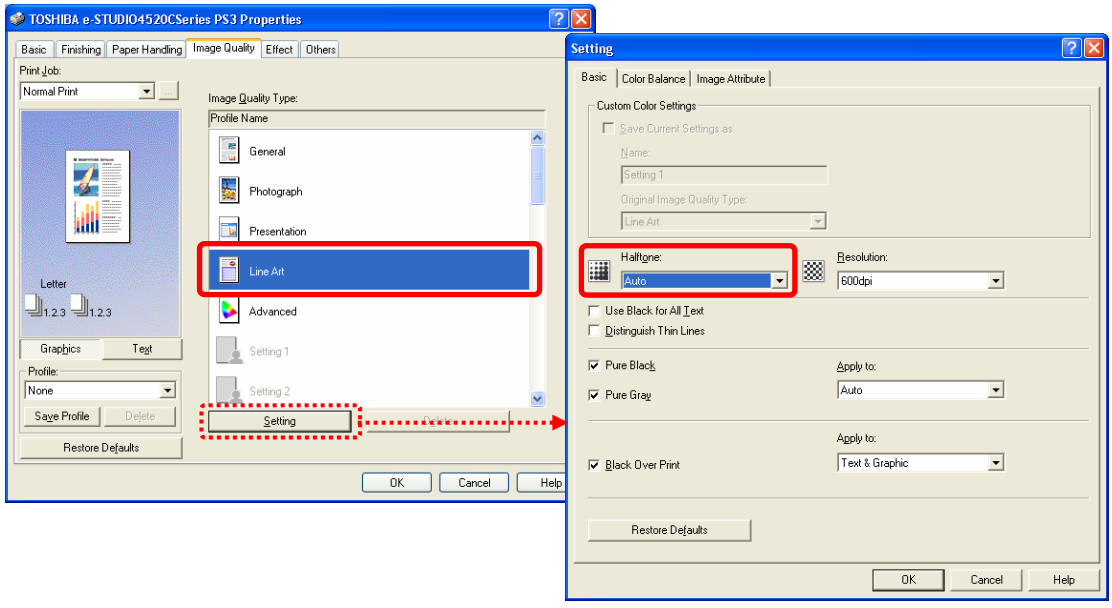
Open the property page of the printer driver. Change the "Image Quality Type" and "Halftone" options in the Image Quality tab.

• Set either of the following options, in accordance with the type of original to print:

• Image Quality Type: "Presentation" (To make color darker)
Halftone: "Detail" (To make the halftone screen high frequency)



• Image Quality Type: "Line Art" (To make the color darker and enhance thin lines)
Halftone: "Auto" or "Detail" (To make the halftone screen high frequency)



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For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Change the "Image Type" and "Halftone" options.

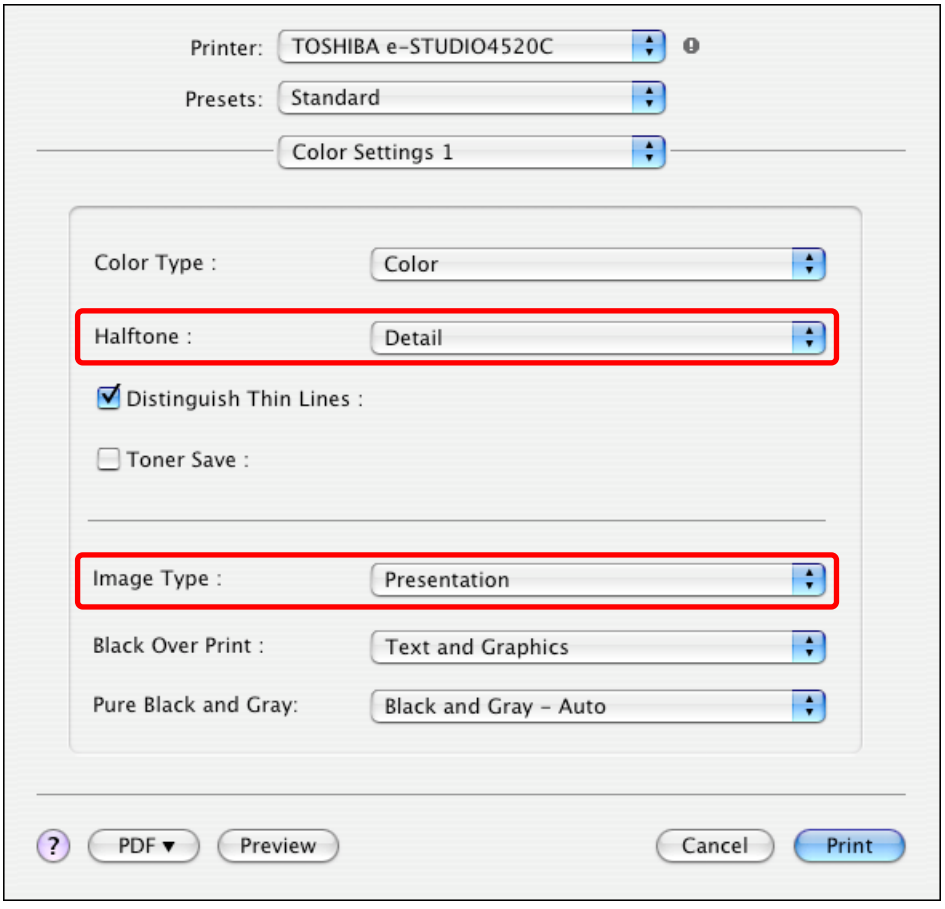
* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 2" ⇨ "Image Type" "Printer Features" ⇨ "Feature Sets: Color settings 1" ⇨ "Halftone"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Image Type", "Halftone"

• Set either of the following options, in accordance with the type of original to print:

• Image Type: "Presentation" (To make color darker)

Halftone: "Detail" (To make the halftone screen high frequency)



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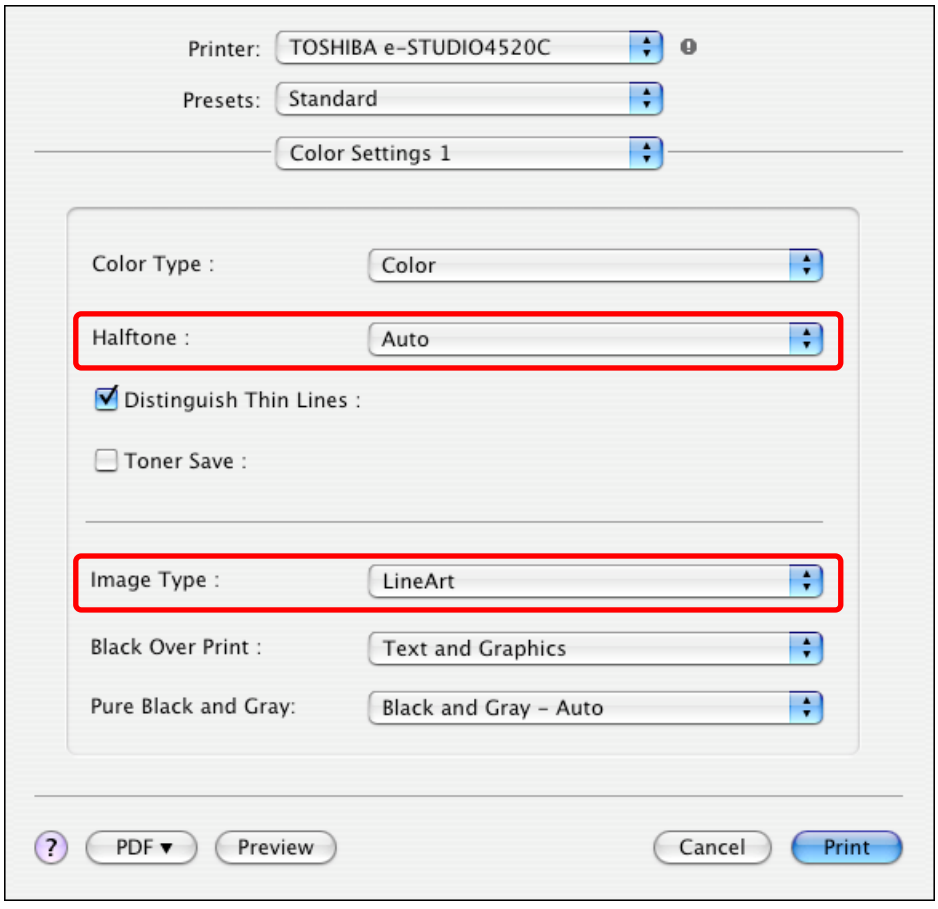
• Image Type: "Line Art" (To make the color darker and enhance thin lines)

Halftone: "Auto" or "Detail" (To make the halftone screen high frequency)



After changing the options on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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(2) In procedure (1), if "LineArt" is selected from among the "Image Quality Type" options, in order to adjust raster data (print image) or graphic data (line drawing), change the "Sharpness" option on the printer driver.

For Windows

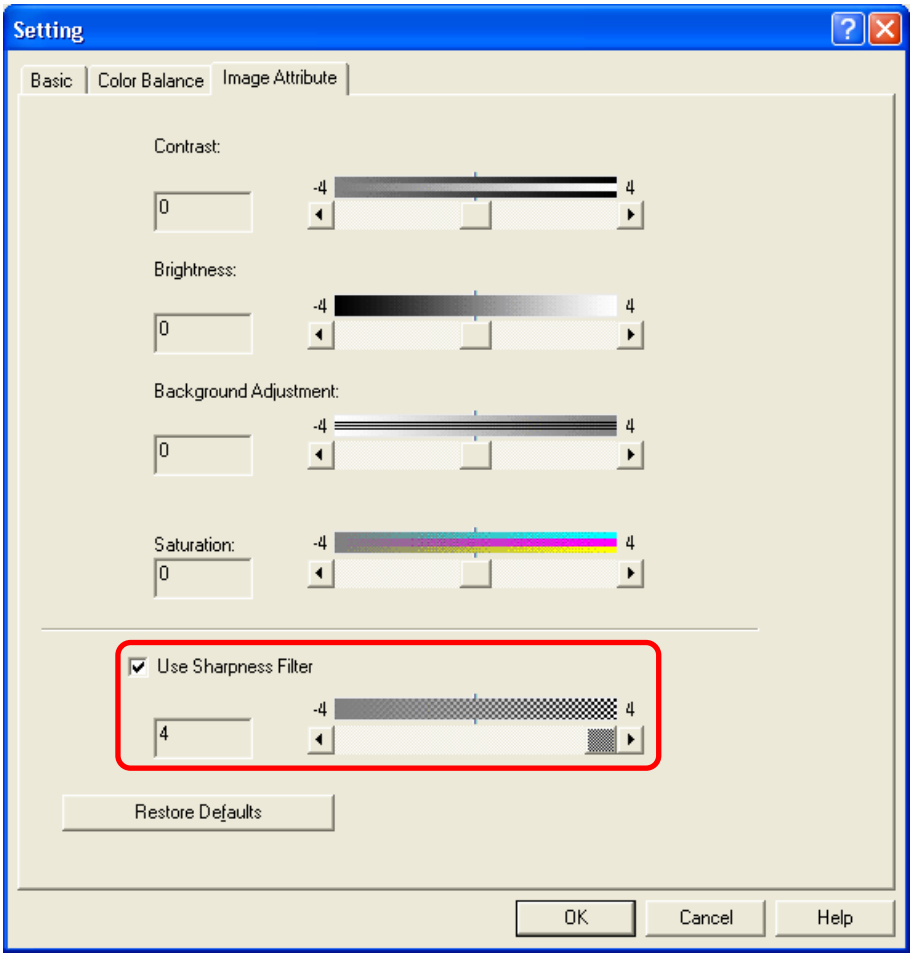
PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Set the value for "Use Sharpness Filter" within a range of "1" to "4" in the "Image Attribute" tab.

• Setting "4" provides the sharpest print image.

* Initially, set "4" and check the printout. If further image quality adjustments are still necessary, refer to <Hint> to do this.



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For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

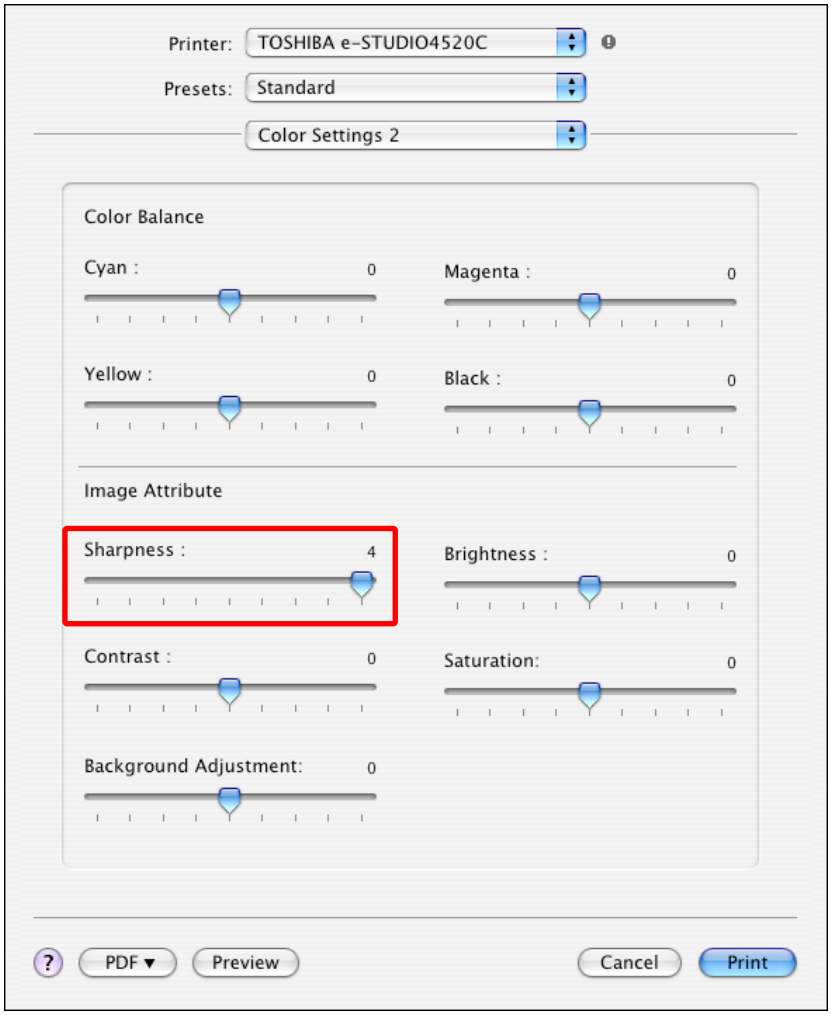
Open the print dialog box. Set the value for "Sharpness" within a range of "1" to "4."

• Setting "+4" provides the sharpest print image.

* Initially, set "4" and check the printout. If further image quality adjustments are still necessary, refer to <Hint> to do this.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 4" ⇨ "Sharpness"
10.3.x / 10.4.x/10.5x	"Color Settings 2" ⇨ "Sharpness"



<Hint> In addition to the sharpness adjustment, decreasing "Brightness" (moving to the [-] side), changing "Contrast" or increasing "Saturation" (moving to the [+] side) may improve the image quality.

After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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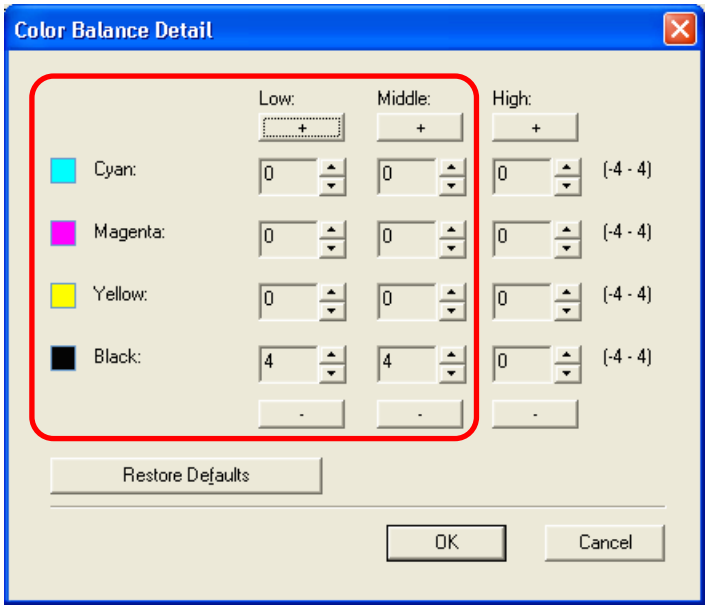
PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

(3) Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.
Mark the "Detail" checkbox in the "Color Balance" tab. Press the [Edit] button.
Set the value for the Low/Middle density of the color you would like to adjust, within a range of "1" to "4" in the "Color Balance Details" option.
*This adjustment will have an effect only on printing on the Windows PCL6 or PS3 emulation printer driver. (This adjustment cannot be performed on a Macintosh printer driver.)

* Initially, set "4" and check the printout.



After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

PCL6 PS3 XPS Mac * This adjustment will have an effect only on Auto or Color mode printing.

(4) Enter adjustment mode [05]. Adjust the color balance.
• Use steps (a) to (b) to adjust the color balance.

(a) Enter adjustment mode [05]. Select code [396]. Press the [START] button.
• Image quality control will be forcibly performed to correct variations in image contrast.

(b) Enter adjustment mode [05]. Change the values for codes [8054 to 8057] or [8062 to 8065] or [8046 to 8049] to adjust the color balance and increase the color density.
• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

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Ex.: • When printing on Windows is performed with the following options selected: PCL6, Image Quality Type = Presentation, Halftone =Detail
> Change the values for Y: 05-8062, M: 05-8063, C: 05-8064 and K: 05-8065.

• When printing on Macintosh is with the following option selected: Image Type = Line Art, Halftone = Auto
> Change the values for Y: 05-8054, M: 05-8055, C: 05-8056 and K: 05-8057.
* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

Color to adjust	PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	PCL6	Detail	05-8062	0/1/2	Set a value larger than 128.	0 to 255	128
	PS3	Detail	05-8054	0/1/2			
	XPS	Detail	05-8046	0/1/2			
M (Magenta)	PCL6	Detail	05-8063	0/1/2			
	PS3	Detail	05-8055	0/1/2			
	XPS	Detail	05-8047	0/1/2			
C (Cyan)	PCL6	Detail	05-8064	0/1/2			
	PS3	Detail	05-8056	0/1/2			
	XPS	Detail	05-8048	0/1/2			
K (Black)	PCL6	Detail	05-8065	0/1/2			
	PS3	Detail	05-8057	0/1/2			
	XPS	Detail	05-8049	0/1/2			

* Set the value in increments of approximately 20, while checking the printouts until the optimum value is obtained.

* The value for [05] code for K (black) will affect black-and-white images (including text, lines and photos) on the printout.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note> This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the value for [05] code for PCL6 and Detail is changed, it will be applied to printing performed with PCL6 and Halftone = "Detail" (or "Auto") selected.)
Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.
If "Smooth" is selected from among the "Halftone" options, this adjustment will have no affect.

After adjusting the color balance, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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PS3 Mac * This adjustment will have an effect only on Auto or Color mode printing.

(5) Enter adjustment mode [05]. Increase the values for codes [8110 to 8113] to perform fine adjustment and increase the sharpness intensity.

• Adjust the value for [05] code corresponding to the print option to be applied (Color mode and Image quality type).

Color mode	Image quality type	[05] code	Subcode	Recommended value	Acceptable value range	Default
Auto / Color	General	05-8110	0/1/2	Set a value larger than 128.	0 to 255	128
	Photograph	05-8111	0/1/2			
	Presentation	05-8112	0/1/2			
	Line Art	05-8113	0/1/2			

Subcode	Apply to
0	Text
1	Graphics
2	Image

* Set the value in increments of approximately 5, while checking the printouts until the optimum value is obtained.

<Hint> This adjustment affects on the following areas according to Image Quality Type:

- General, Photograph, and Presentation: Only raster data (print image)
- Line Art: Only thin lines, small text and raster data

<Note> This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Sharpness" option. Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause outlined edges, incorrect color of thin lines, jaggies, and variations in gradation. As a result the photo image may look unnatural. Therefore, carefully perform the adjustment, while checking the printouts.

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3.14.2 To Adjust the Print Image Quality in the Black and White Mode

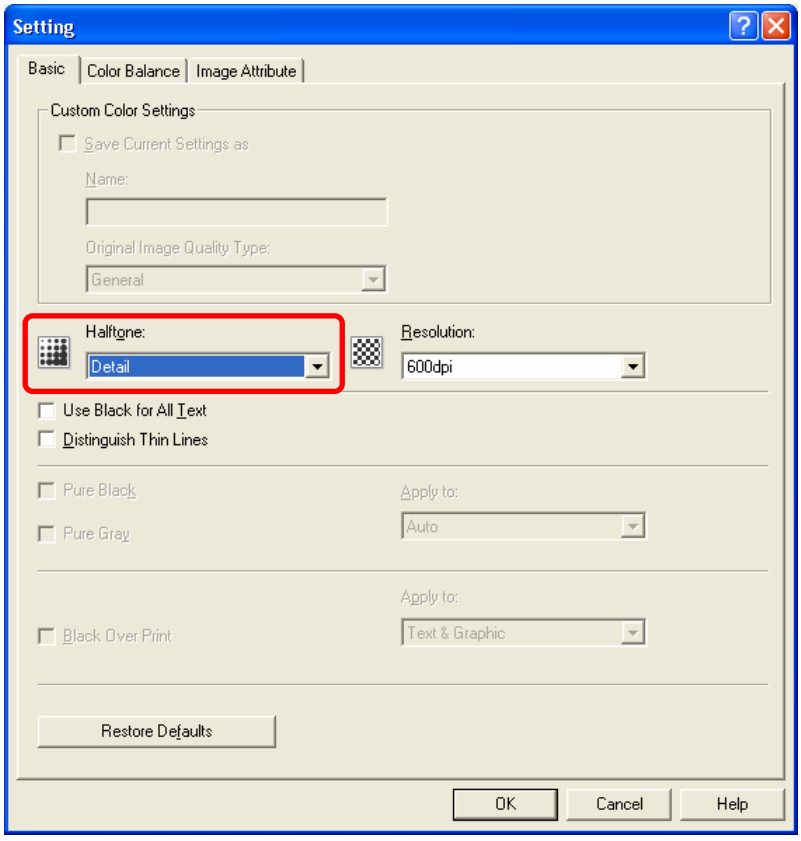
* Perform the adjustment in accordance with the procedures below.
* Both the service technician and the user can use procedure (1).
* Only the service technician must use procedures (2) and (3).

(1) Change the "Halftone" option on the printer driver.

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Black and white mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.
Select "Detail" from among the "Halftone" options in the “Basic” tab.



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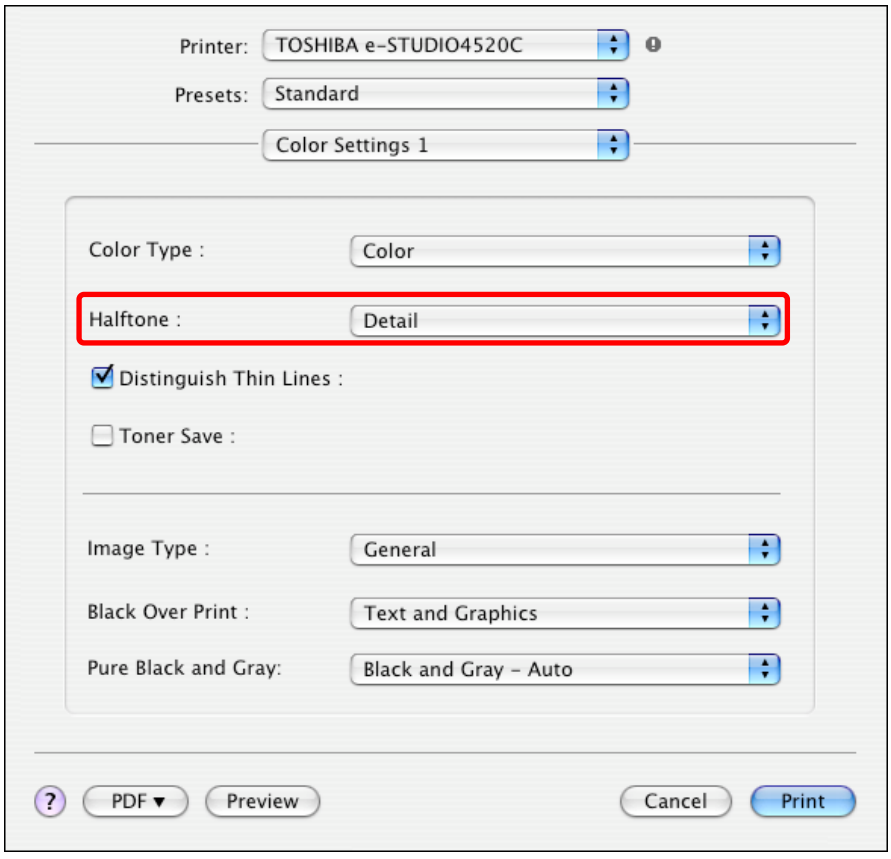
For Macintosh

Mac * This adjustment will have an effect only on Black and white mode printing.

Open the print dialog box. Select "Detail" from among the "Halftone" options.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 1" ⇨ "Halftone"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Halftone"



After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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PCL6 PS3 XPS Mac * This adjustment will have an effect only on Black and white mode printing.

(2) Enter adjustment mode [05]. Increase the values for codes [7315 to 7320] to adjust the gamma curve balance and increase the density on Black and White mode printing.

• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
PS3	Smooth	05-7315	0/1/2	Set a value larger than 128	0 to 255	128
	Detail	05-7316	0/1/2			
PCL6	Smooth	05-7317	0/1/2			
	Detail	05-7318	0/1/2			
XPS	Smooth	05-7319	0/1/2			
	Detail	05-7320	0/1/2			

* Set the value in increments of approximately 10, while checking the printouts until the optimum value is obtained.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note>

- This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Halftone" option. (For instance, if the value for [05] code for PCL and Detail is changed, it will be applied to printing performed with PCL6 and Halftone = "Detail" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

- When "Mono" is selected from among the "Color" options and "Auto" (default) is selected from among the "Halftone" options, "Detail" of the "Halftone" options is applied to text and graphics (illustrations), and "Smooth" is applied to raster data (images). Therefore, particular attention is required since the adjustment may have a different impact according to the patterns of the image to be printed.

After increasing the density, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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PS3 Mac * This adjustment will have an effect only on Black and white mode printing.

(3) Enter adjustment mode [05]. Increase the value for code [8118] to perform fine adjustment and increase the sharpness intensity.

• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Color mode).

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

PDL	Color mode	[05] code	Sub code	Recommended value	Acceptable value range	Default
PS3	Black and White	05-8118	0/1/2	Set a value lager than 128	0 to 255	128

Subcode	Original
0	Text
1	Grahpics
2	Image

* Set the value in increments of approximately 5, while checking the printouts until the optimum value is obtained.

<Note> This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Sharpness" option. Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause outlined edges, jaggies and variations in gradation. As a result the photo image may look unnatural. Therefore, carefully perform the adjustment, while checking the printouts.

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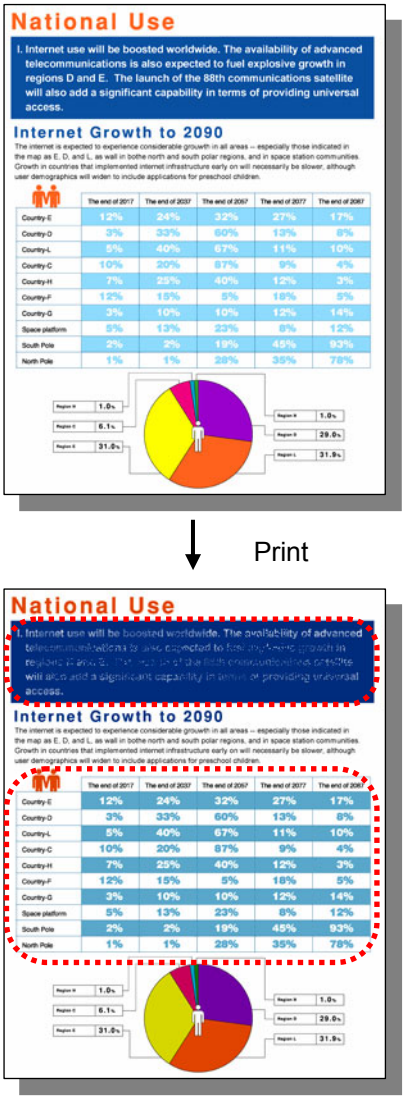
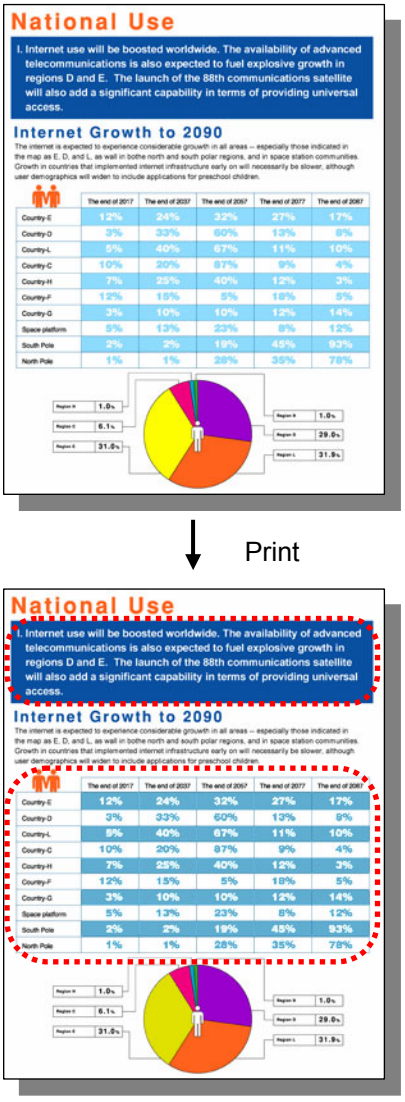
3.15 To Make the Light-Colored Area Darker on the Printout

Before the adjustment


National Use
I. Internet use will be boosted worldwide. The availability of advanced telecommunications is also expected to fuel explosive growth in regions D and E. The launch of the 88th communications satellite will also add a significant capability in terms of providing universal access.
Internet Growth to 2090
Print

The light-colored area becomes darker but the highly colored area becomes blurred.

After the adjustment


National Use
I. Internet use will be boosted worldwide. The availability of advanced telecommunications is also expected to fuel explosive growth in regions D and E. The launch of the 88th communications satellite will also add a significant capability in terms of providing universal access.
Internet Growth to 2090
Print

Only the light-colored area becomes darker.

❑ Explanation

When the entire image is printed darker to make the light-colored area darker, the highly colored area may become much darker and blurred. Change the options on the printer driver or adjust the color balance, in order to make only the light-colored area darker while leaving the highly colored area as it is.

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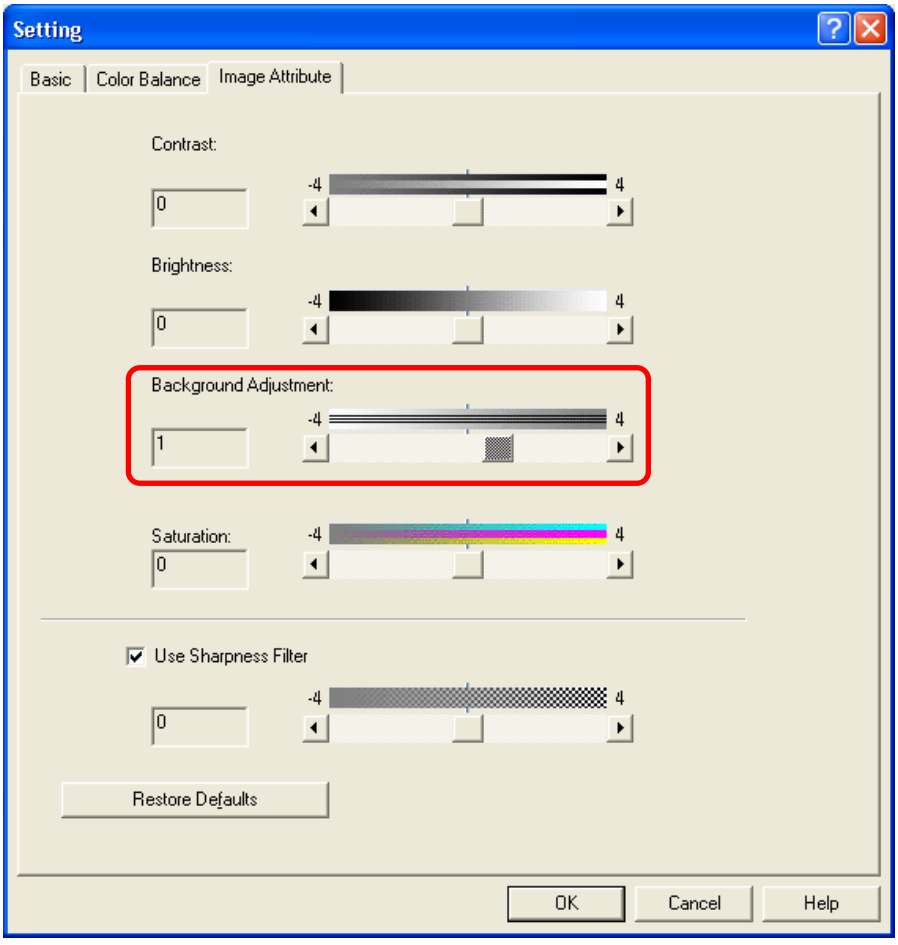
❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Both the service technician and the user can use procedure (1).
* Only the service technician must use procedures (2) and (3).
* The item to set varies depending on the type of data to adjust. Select an effective option according to the data format to adjust, such as a print image (raster data), text (font), and line drawing (graphic data).

For Windows

PCL6 PS3 XPS *This adjustment will have an effect only on Auto or Color mode printing.

(1) Open the property page of the printer driver and press [Setting] button in the "Image Quality" tab. Set the "Background adjustment" option in the "Image Attribute" tab within the range of "1" to "4".



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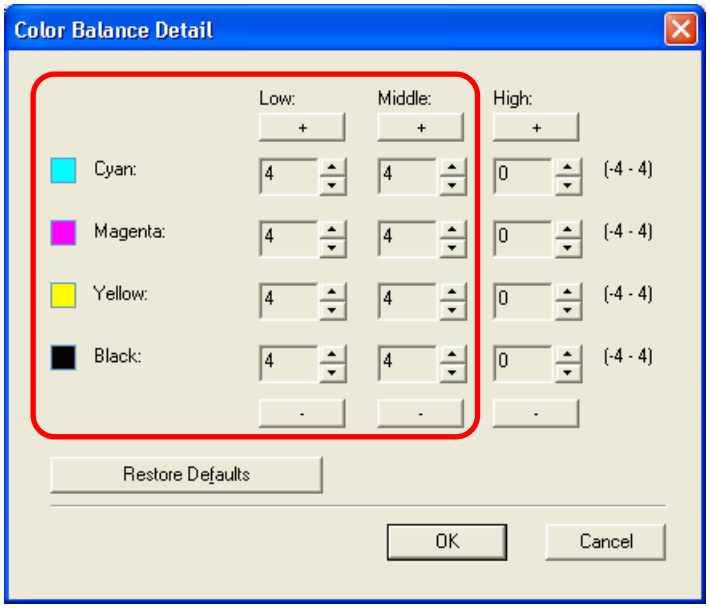
PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

(2) Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.
Mark the "Detail" checkbox in the "Color Balance" tab. Press the [Edit] button.
Set the value for the Low/Middle density of the color you would like to adjust, within a range of "1" to "4" in the "Color Balance Details" option.

* This adjustment will have an effect only on printing on a Windows PCL6 or PS3 or XPS emulation printer driver.
(This adjustment cannot be performed on a Macintosh printer driver.)

* Initially, set "4" and check the printout.



After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure according to the image type.

- To adjust the color image: Go to procedure (3).
- To adjust the black and white image: Go to procedure (4).

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PCL6 PS3 Mac * This adjustment will have an effect only on Auto or Color mode printing.

(3) Enter adjustment mode [05]. Increase the values for codes [8042 to 8065] to increase the Low/Middle density of the color.

• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL6, Image Quality Type = General, Halftone = Auto

> Text area, graphic area and image area

Change the values for Y: 05-8058, M: 05-8059, C: 05-8060 and K: 05-8061.

• When printing on Macintosh is performed with the following option selected: Image Type = Photograph, Halftone = Smooth

> Change the values for Y: 05-8050, M: 05-8051, C: 05-8052 and K: 05-8053.

*Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

Color to adjust	PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	PCL5c	Smooth	05-8058	0/1	Set a value larger than 128.	0 to 255	128
		Detail	05-8062	0/1			
	PS3	Smooth	05-8050	0/1			
		Detail	05-8054	0/1			
	XPS	Smooth	05-8042	0/1			
		Detail	05-8046	0/1			
M (Magenta)	PCL5c	Smooth	05-8059	0/1			
		Detail	05-8063	0/1			
	PS3	Smooth	05-8051	0/1			
		Detail	05-8055	0/1			
	XPS	Smooth	05-8043	0/1			
		Detail	05-8047	0/1			
C (Cyan)	PCL5c	Smooth	05-8060	0/1			
		Detail	05-8064	0/1			
	PS3	Smooth	05-8052	0/1			
		Detail	05-8056	0/1			
	XPS	Smooth	05-8044	0/1			
		Detail	05-8048	0/1			
K (Black)	PCL5c	Smooth	05-8061	0/1			
		Detail	05-8065	0/1			
	PS3	Smooth	05-8053	0/1			
		Detail	05-8057	0/1			
	XPS	Smooth	05-8045	0/1			
		Detail	05-8049	0/1			

*Set the value in increments of approximately 20, while checking the printouts until the optimum value is obtained.

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* "Halftone" refers to how halftones are printed. Two options are available: "Smooth" which is intended to improve the reproducibility of gradation and "Detail" which is intended to print halftones in details (with the high frequency).
The halftone option to be applied in printing can be selected from among the "Halftone" options on the printer driver (Windows) or in the print dialog box (Macintosh).
"Auto" is selected from among the "Apply to" options by default. It is intended to automatically select "Smooth" or "Detail" in accordance with "Apply to" of the halftone option, the selected "Color" and "Image Quality Type" options, as described in the table below.

Apply to	"Color" and "Image Quality Type" options					
	Auto/Color				Black and White	Twin Color
	General	Photograph	Presentation	Line Art		
Text	Detail	Detail	Detail	Detail	Detail	Detail
Graphic (Illustration, line, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth
Image (Photograph, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note> This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the value for [05] code for PCL6 and Smooth is changed, it will be applied to printing performed with PCL6 and Halftone = "Smooth" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

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PCL6 PS3 XPS Mac * This adjustment will have an effect only on Black and white mode printing.

(4) Increase the values for codes [7315 to 7320] to adjust the gamma curve balance and increase the Low/Medium density on Black and White mode printing.

• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
PS3	Smooth	05-7315	0/1/2	Set a value larger than 128	0 to 255	128
	Detail	05-7316	0/1/2			
PCL6	Smooth	05-7317	0/1/2			
	Detail	05-7318	0/1/2			
XPS	Smooth	05-7319	0/1/2			
	Detail	05-7320	0/1/2			

* Set the value in increments of approximately 10, while checking the printouts until the optimum value is obtained.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note>

- This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Halftone" option. (For instance, if the value for [05] code for PCL and Detail is changed, it will be applied to printing performed with PCL6 and Halftone = "Detail" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

- When "Mono" is selected from among the "Color" options and "Auto" (default) is selected from among the "Halftone" options, "Detail" of the "Halftone" options is applied to text and graphics (illustrations), and "Smooth" is applied to raster data (images). Therefore, particular attention is required since the adjustment may have a different impact according to the patterns of the image to be printed.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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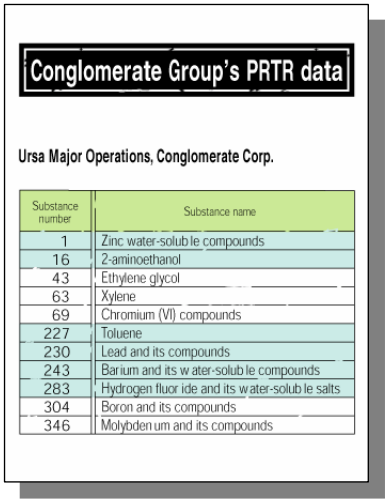
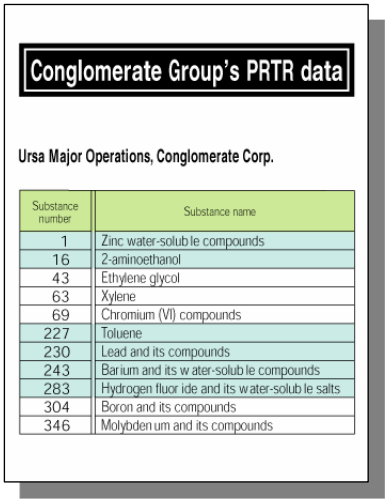
3.16 To Clearly Print Thin Lines/Double Lines

Before the adjustment



Thin lines or double lines are dotted on the printout.

After the adjustment



The thin lines or double lines are clearly printed out.

❑ Explanation

When thin lines or double lines, which are laid out on a solid filled area, are printed out, they may be dotted on the printout. Change the option on the printer driver, in order to clearly print them out.

❑ Procedures

*Both the service technician and the user can perform all adjustments.

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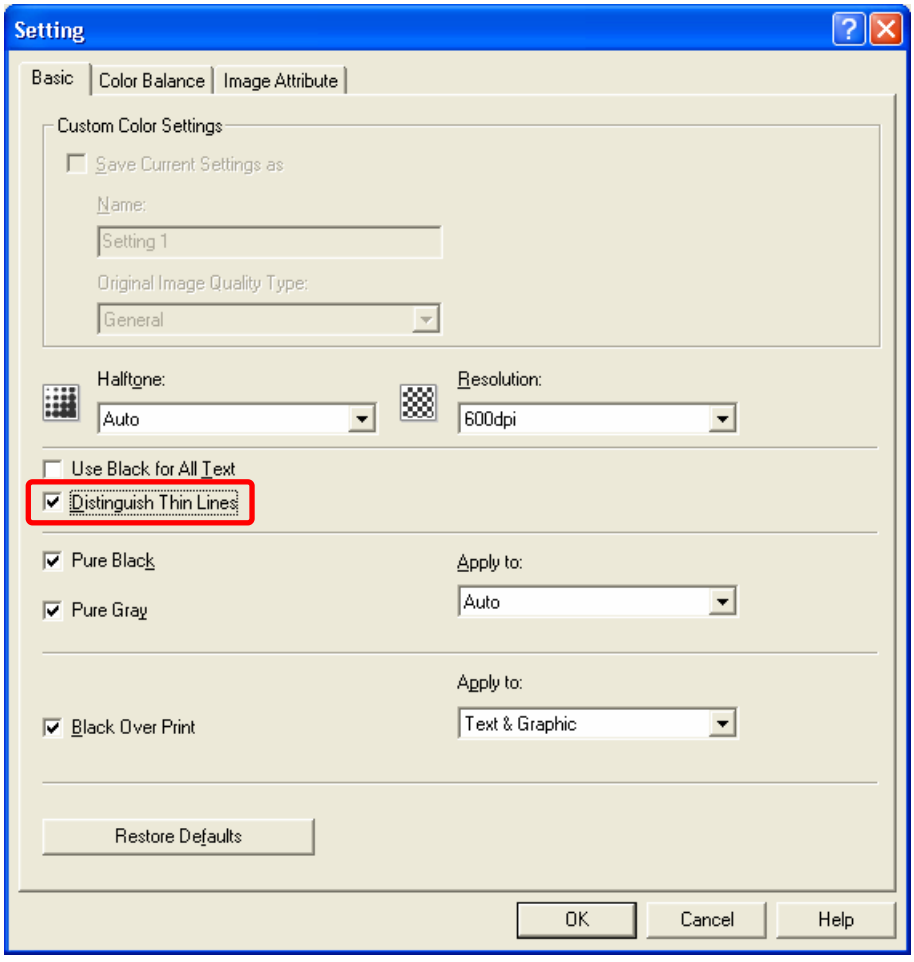
(1) Enable the "Distinguish Thin Line" option on the printer driver.

For Windows

PCL6 PS3 XPS

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Mark the "Distinguish Thin Line" checkbox in the "Basic" tab.



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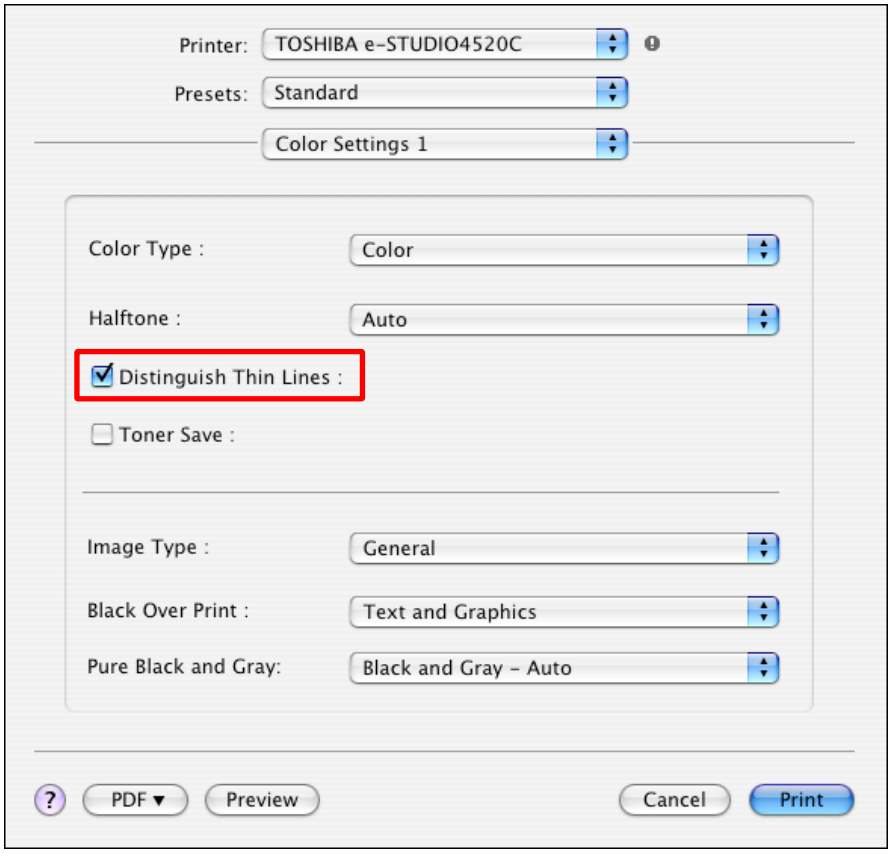
For Macintosh

Mac

Open the print dialog box. Enable the "Distinguish Thin Line" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 1" ⇨ "Distinguish Thin Lines"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Distinguish Thin Lines"



❑ Precautions after the completion of the adjustment

Performing this adjustment on thin lines may not provide satisfactory results. In this case, it is recommended to perform the adjustment in conjunction with 3.14 To Clearly Print Light-Colored Thin Lines or Text be made.

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3.17 To Decrease the Image Density and Save Toner

(To Print in the Toner Save Mode)

Before the adjustment

Default printing.

After the adjustment

Printing is performed, while the toner is being saved.

❑ Explanation

The e-E-STUDIO2330C/2820C/2830C/3520C/3530C/4520C offers a toner save mode. It is intended to automatically decrease the image density and reduce the amount of toner used. Change the option on the printer driver and perform printing in the toner save mode, for instance, if a large number of copies have to be printed, or if the image density is too high.

❑ Procedures

*Both the service technician and the user can perform all adjustments.

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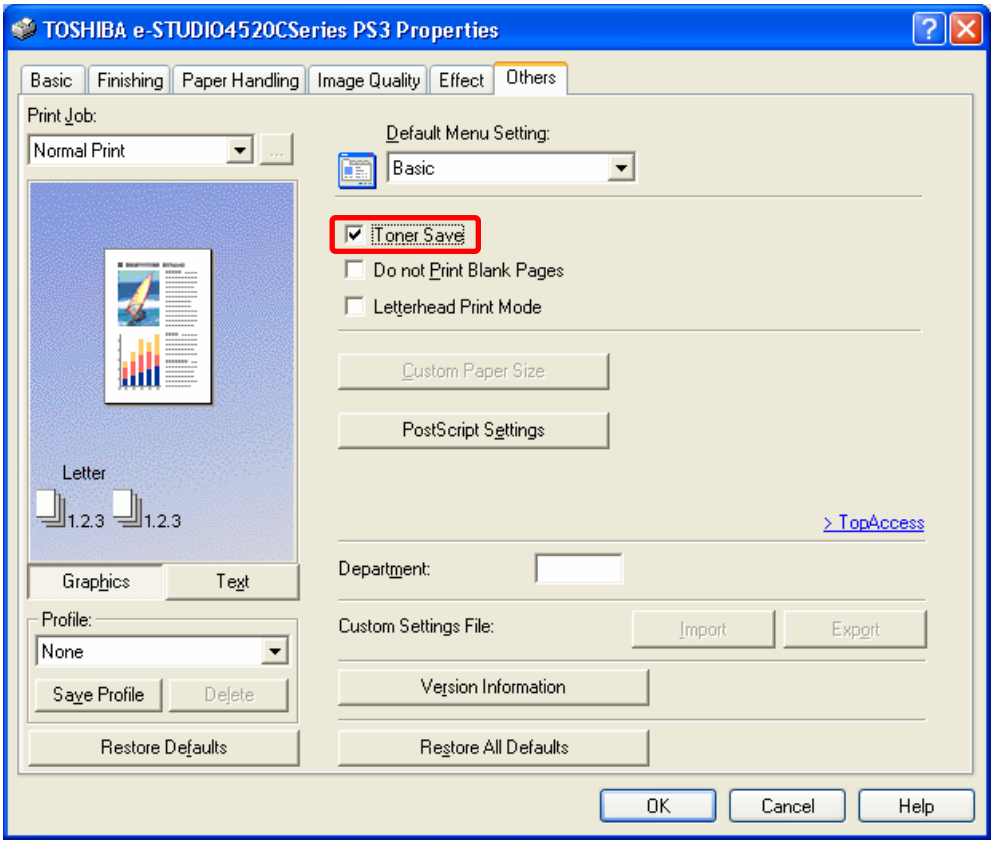
(1) Enable the "Toner Save" option on the printer driver.

For Windows

PCL6 PS3 XPS

Open the property page of the printer driver. Mark the "Toner Save" checkbox in the "Others" tab.



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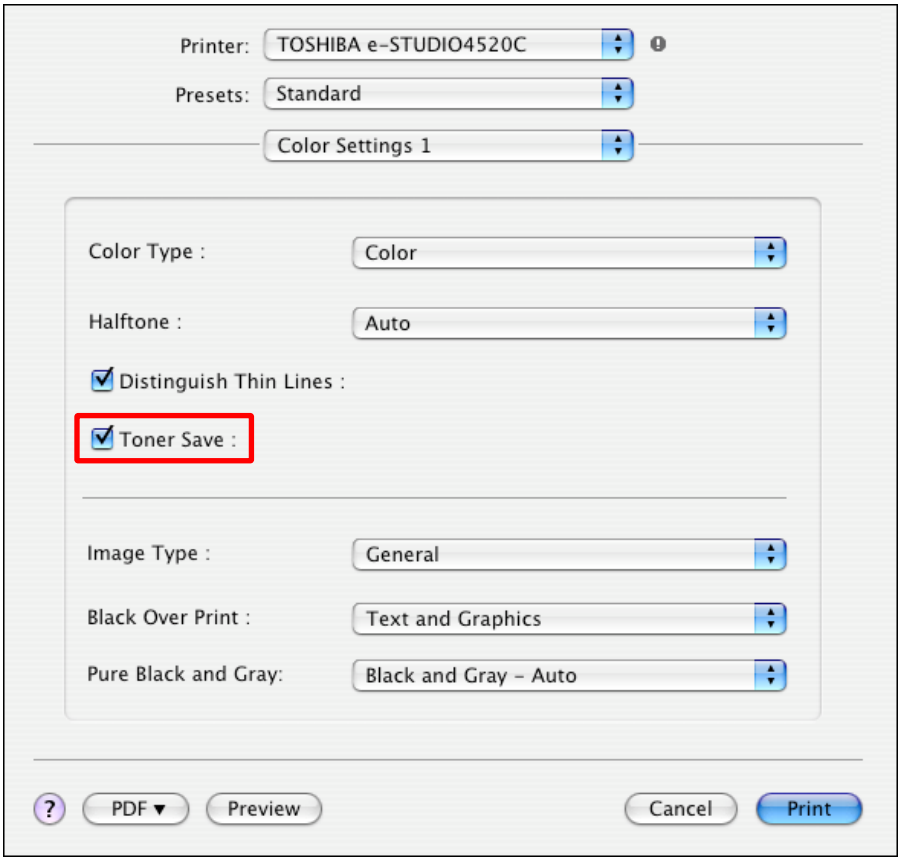
For Macintosh

Mac

Open the print dialog box. Enable the "Toner Save" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Printing Modes" ⇨ "Toner Save"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Toner Save"



❑ Precautions after the completion of the adjustment

The adjustment may possibly provide the image density lower than the user desires, when printing is performed in the toner save mode. Therefore, carefully perform the adjustment, while checking the printouts.

❑ Remarks

The print density in the toner save mode can also be adjusted. For further information regarding the adjustment procedures, refer to 3.18 To Adjust the Image Density in the Toner Save Mode.

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3.18 To Adjust the Image Density in the Toner Save Mode

Before the adjustment

The image density is too dark, even when printing is performed in the toner save mode.

After the adjustment

The image density in the toner save mode is adjustable, as desired.

❑ Explanation

The e-E-STUDIO2330C/2820C/2830C/3520C/3530C/4520C offers a toner save mode. It is intended to automatically decrease the image density and reduce the amount of toner used. Adjust the upper limit of the image density in the toner save mode, in order to obtain the desired image density requested by a particular user.

❑ Procedures

* The service technician must perform all adjustments.

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PCL6 PS3 XPS Mac

(1) Enter adjustment mode [05]. Change the value to adjust the image density in the toner save mode.

* The [05] code to use varies, depending on whether to adjust the image quality on Full Color or Twin Color printing or on Black and White printing. Use either of the procedures below corresponding to the type of original to print.

To adjust the image quality in Full Color or Twin Color printing

("Auto," "Color" or "Twin Color" is selected from among the "Color" options on the PCL6 or PS3 or XPS printer driver. "Auto," "Color" or "Twin Color" is selected from among the "Color Type" options on Macintosh.)

* The "Color" options are available in the "Basic" tab on the PCL6, PS3 and XPS printer drivers. The "Color Type" options are available in the "Color Settings 1" menu in the print dialog box on Macintosh.

(a) Enter adjustment mode [05]. Change the value for code [1055] to adjust the upper limit of the image density in the toner save mode.

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

PDL	[05] code	Subcode	Recommended value	Acceptable value range	Default
PS3	05-1055	0	Set a value smaller than 176 to decrease the density. Set a value larger than 176 to increase the density.	0 to 255	176
PCL6	05-1055	1			
XPS	05-1055	2			

* Set the value in increments of approximately 10, while checking the printouts until the optimum value is obtained.

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To adjust the image quality on Black and White printing

("Black and White" is selected from among the "Color" options on the PCL6 or PS3 or XPS printer driver. "Mono" is selected from among the "Color Type" options on Macintosh.)

* The "Color" options are available in the "Basic" tab on the PCL6, PS3 and XPS printer drivers. The "Color Type" options are available in the "Color Settings 1" menu in the print dialog box on Macintosh.

(a) Enter adjustment mode [05]. Increase the value for code [664] to adjustment the upper limit of the image density in the toner save mode.

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

PDL	[05] code	Subcode	Recommended value	Acceptable value range	Default
PS3	05-664	0	Set a value smaller than 176 to decrease the density. Set a value larger than 176 to increase the density.	0 to 255	176
PCL6	05-664	1			
XPS	05-664	2			

* Set the value in increments of approximately 10, while checking the printouts until the optimum value is obtained.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause an increase of the amount of toner used (if the image density is increased) or provide faint print images (if the image density is decreased). Therefore, carefully perform the adjustment, while checking the printouts.

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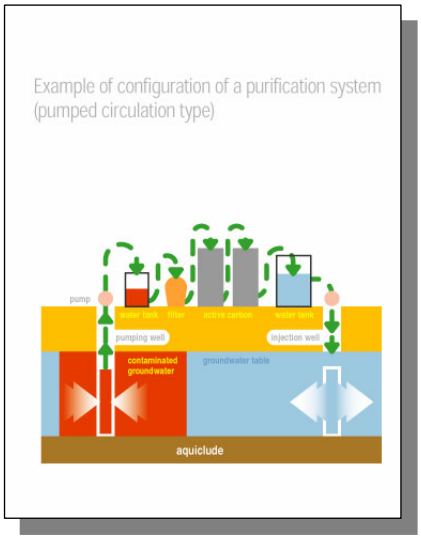
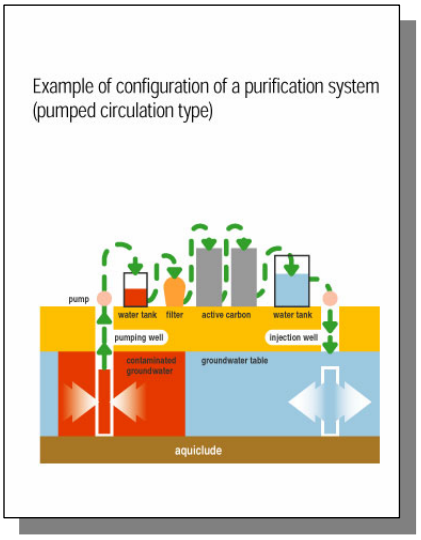
3.19 To Print Illegible Gray or Colored Text in Black

Before the adjustment



Gray, yellow and cyan text is illegible on the printouts.

After the adjustment



The gray, yellow or cyan text is printed in black. This makes it more legible on the printouts.

❑ Explanation

Text may look illegible on the printout, depending on the hues of the background and the text contained in the original, particularly, when printing an original containing yellow, light blue or gray text on a light-colored background. In addition, when a full-color original is printed in the Black and White mode, the colored text may turn gray on the printout and eventually become illegible. In this case, change the option on the printer driver, in order to reproduce the colored text (except the white text) in black and make it more legible on the printout.

* This adjustment will have an effect only on printing on a Windows PCL6 or PS3 or XPS emulation printer driver.
(This adjustment cannot be performed on a Macintosh printer driver.)

❑ Procedures

* Both the service technician and the user can perform all adjustments.

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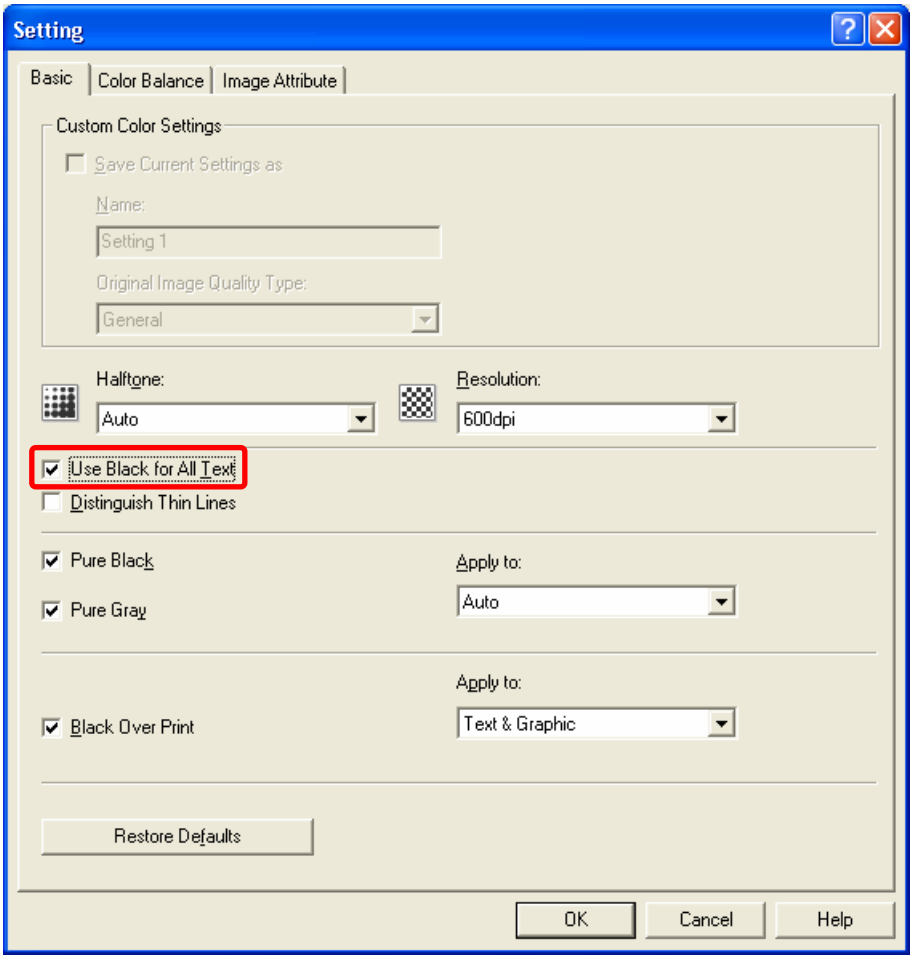
PCL6 PS3 XPS

(1) Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab. Mark the "Use Black for All Text" checkbox in the "Basic" tab.

* This adjustment will be effective, only if a file created on a general application, such as Microsoft Office, is printed in PostScript (PS3). It may not be effective, if a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress) is printed, or a PDF file created on these applications is printed.



❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

Not all colored text may be printed in black, depending on the type of text (e.g. text larger than 72 points).

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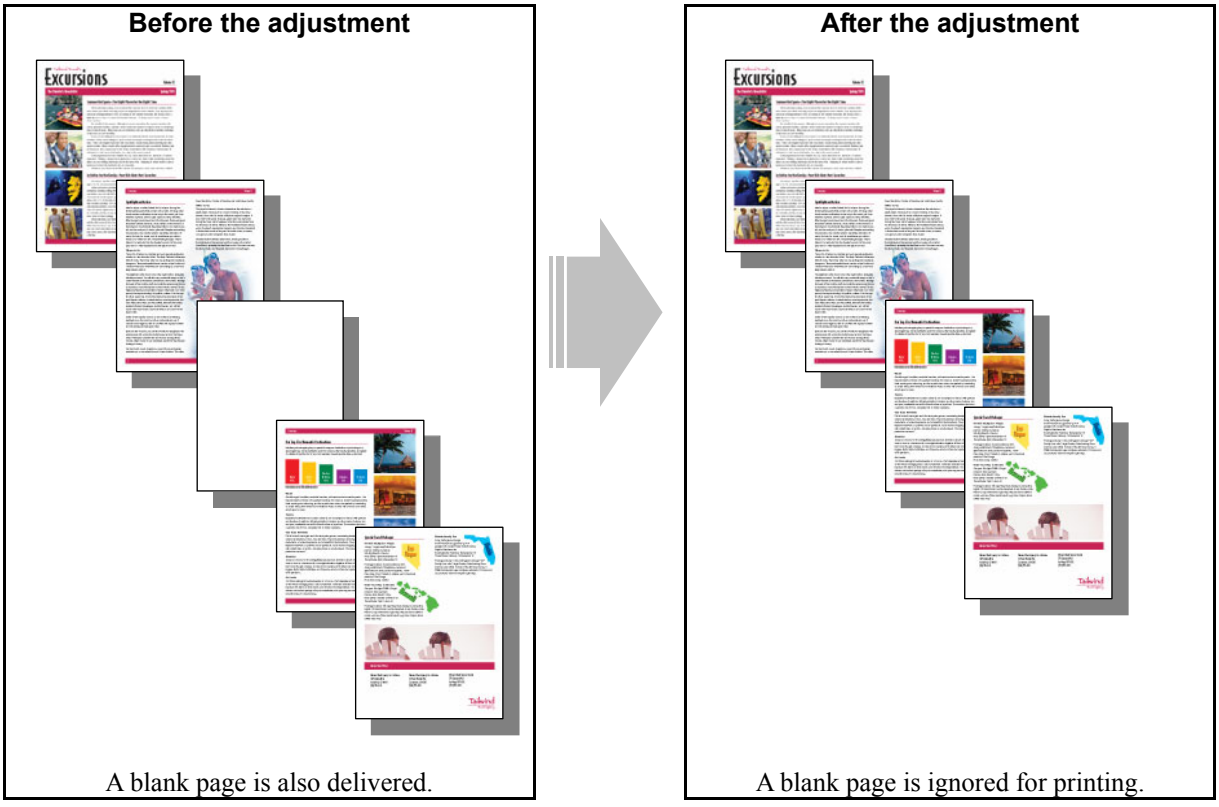
3.20 To Ignore Blank Pages for Printing



❑ Explanation

Some applications may be designed to automatically insert blank pages for laying out the pages of a document.

Change the option on the printer driver, in order to ignore all blank pages for printing.

❑ Procedures

*Both the service technician and the user can perform all adjustments.

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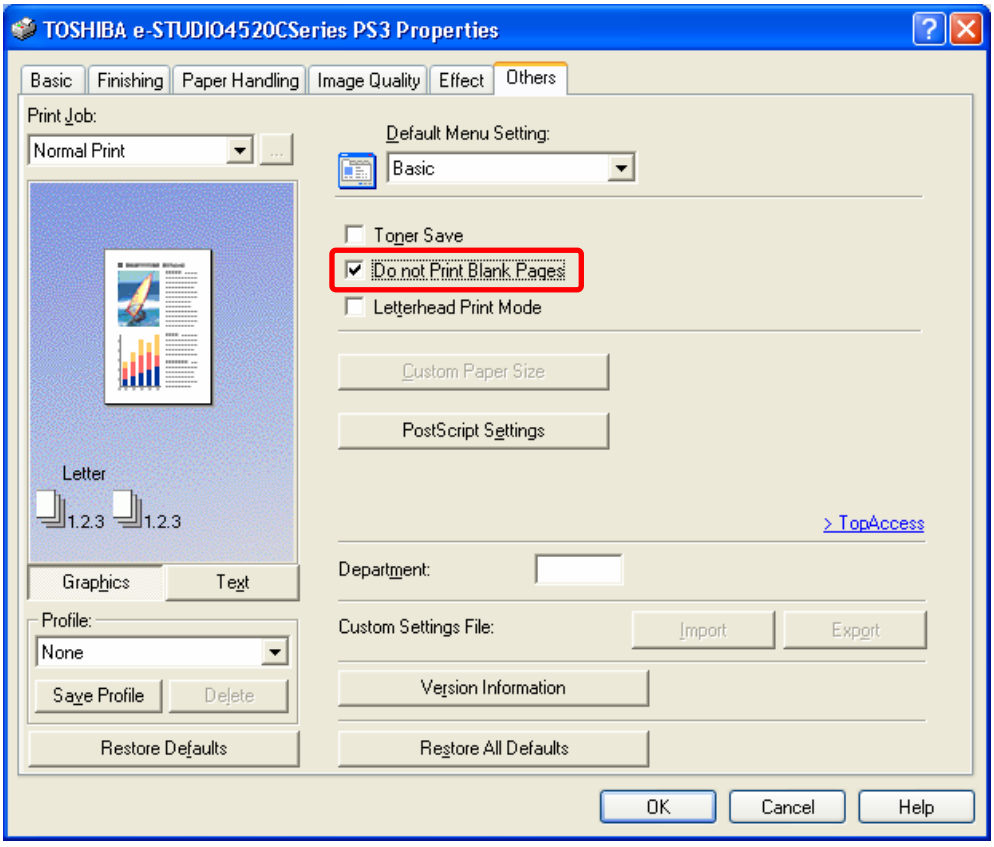
(1) Enable the "Do not Print Blank Pages" option on the printer driver.

For Windows

PCL6 PS3 XPS

Open the property page of the printer driver. Mark the "Do not Print Blank Pages" checkbox in the "Others" tab.



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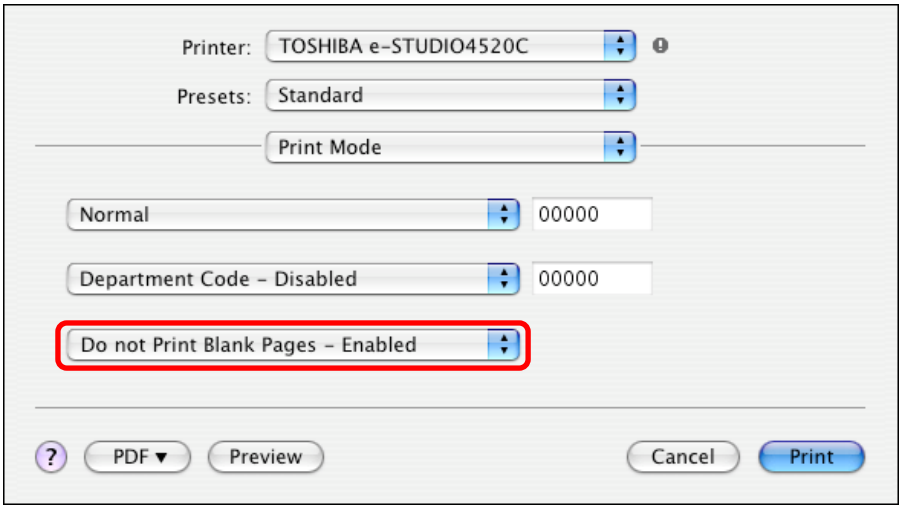
For Macintosh

Mac

Open the print dialog box. Enable the "Do not Print Blank Pages" option.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Printing Modes" ⇨ "Do not Print Blank Pages"
10.3.x / 10.4.x/10.5x	"Print Mode" ⇨ "Do not Print Blank Pages"



❑ Precautions after the completion of the adjustment

The adjustment may not possibly operate the following options as programmed. Therefore, pay special attention to the combination of options.

- Booklet printing
- N-up printing
- Use Front Cover
- Use Back Cover
- Interleave Pages

❑ Remarks

If any data are inserted in the header or footer of a particular page on Excel or Word, even though no data are present in the body, the page will not be recognized as a blank page. The header or footer will be printed out.

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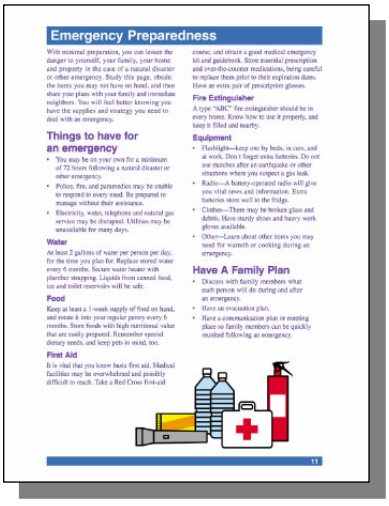
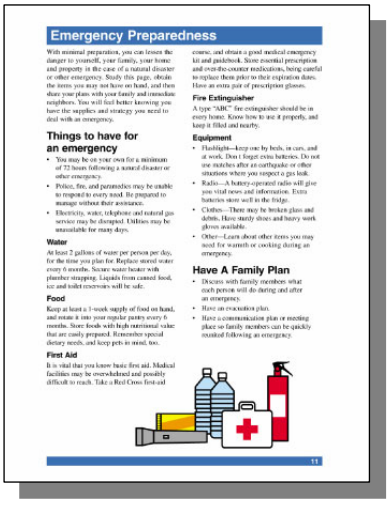
3.21 To Sharply Print Black Text

Before the adjustment



Text looks black on the monitor. But the hue will vary, if it is printed out in the Full color mode.

After the adjustment



The hue of the text is nearly matched with the black hue on the monitor.

❑ Explanation

Text looks black on the monitor. But if it is printed in the Full color mode (with "Auto" selected from among the "Color" options), all color toners (C, M, Y and K) will be used to print it, depending on the application in use. As a result, the black hue on the printout looks different from what the user desires. This problem is caused by the application specifications, not by the printer.

Particularly, the following factors may print black text using all color toners (C, M, Y and K) when a PDF file is printed out:

- The file of black text (CMY = 0%, K = 100%) is printed on the PCL6 printer driver.
- Black text is treated as image data instead of text data on the file.
- Black text is not defined as 100% black (RGB = 0% or CMY = 0%, K = 100%) on the file.

Change the option on the printer driver or adjust the color balance, in order to nearly match the hue of the black text on the file, in which these factors may be included, with the black hue.

As a point to remember, determine whether the text to adjust is entered as an actual text (font) or as a graphic or image data.

❑ Procedures

*Perform the adjustment in accordance with the procedures below.

*Both the service technician and the user can use procedures (1) to (3) and (5).

*Only the service technician must use procedures (4) and (6).

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(1) If printing is performed on a PCL6 printer driver, select a PS3 printer driver.

<Hint> If printing is performed on a PCL6 printer driver, or if a file or a graphic application created on a DTP application, such as Illustrator, QuarkXPress, FreeHand, or CorelDraw, is printed using the CMYK toners, or a high-definition PDF file created on these applications is printed, black text may not be converted into 100% black. But if printing is performed on a PS3 printer driver, black text can be printed in black, as shown on the file.

After printing on the PS3 driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

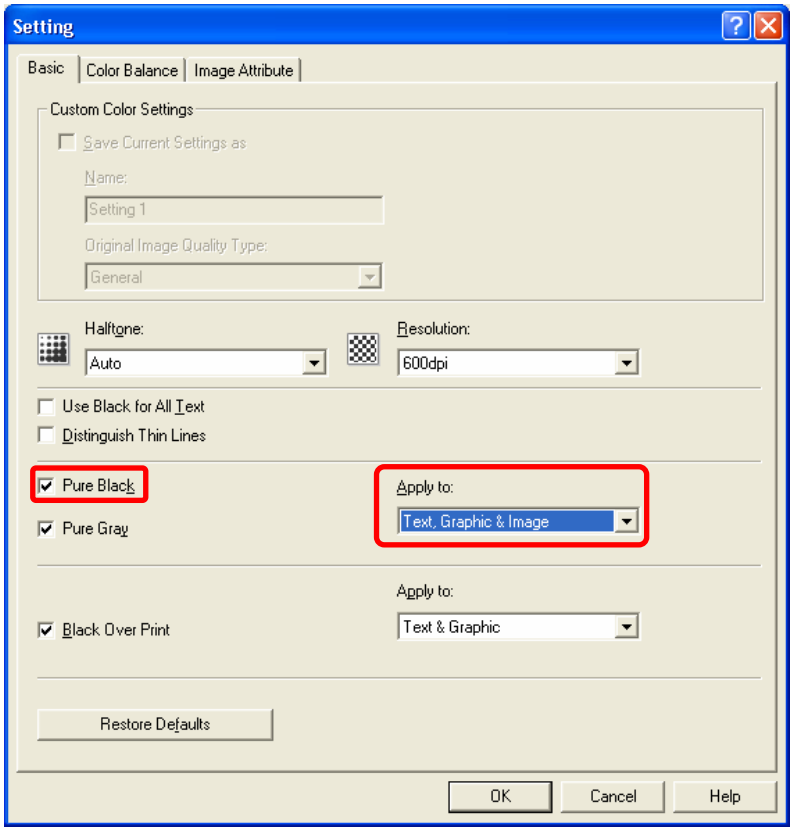
(2) Mark the "Pure Black" checkbox on the printer driver. Select "Text, Graphic & Image" from among the "Apply to" options.

<Hint> Text on the Web page may be raster data (image) created in GIF or JPEG format. Black-and-white data created in PDF format by scanning the original are also raster data. If the "Pure Black" checkbox is marked on the printer driver, "Auto" is selected from among the "Apply to" options by default. Raster data are handled as an image, which is intended to improve the texture, and the 4 color toners (C, M, Y and K) will be used to print black. If "Text, Graphic & Image" is selected from among the "Apply to" options, only the K toner will be used to print black on raster data.

For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Black and white mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab. Mark the "Pure Black" checkbox in the "Basic" tab. Select "Text, Graphic & Image" from among the "Apply to" options.



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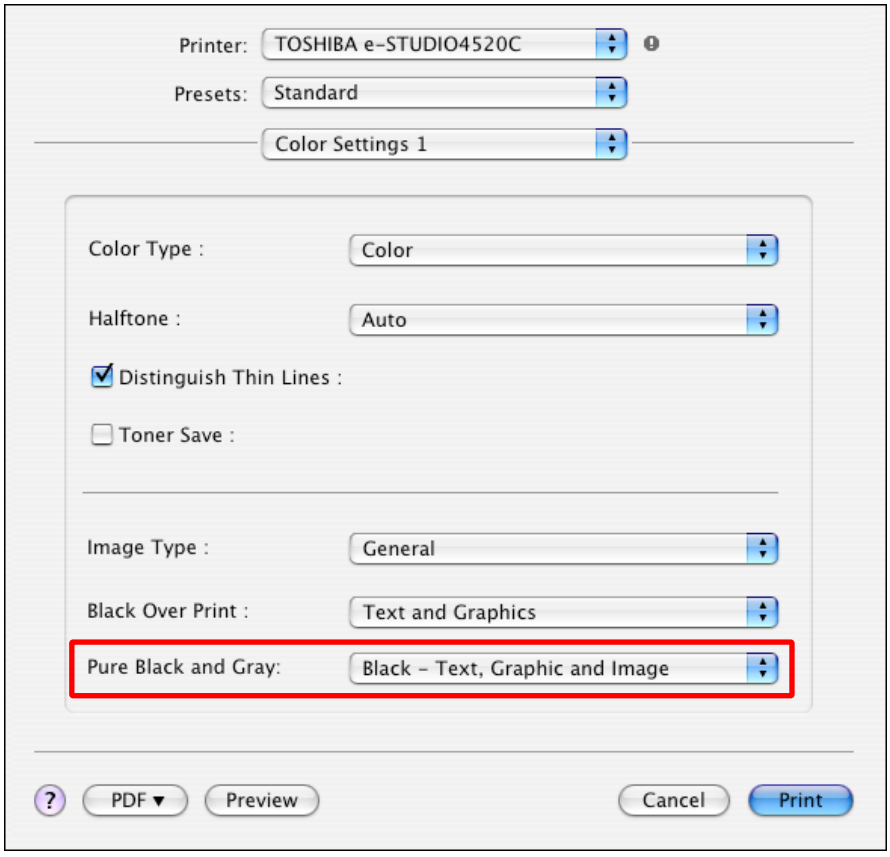
For Macintosh

Mac * This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "Black – Text, Graphic & Image" from among the "Pure Black and Gray" options.

* The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 2" ⇨ "Pure Black and Gray"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Pure Black and Gray"



After changing the option on the printer driver, print and check the print image quality.

If further image quality adjustments are still necessary, use the next procedure.

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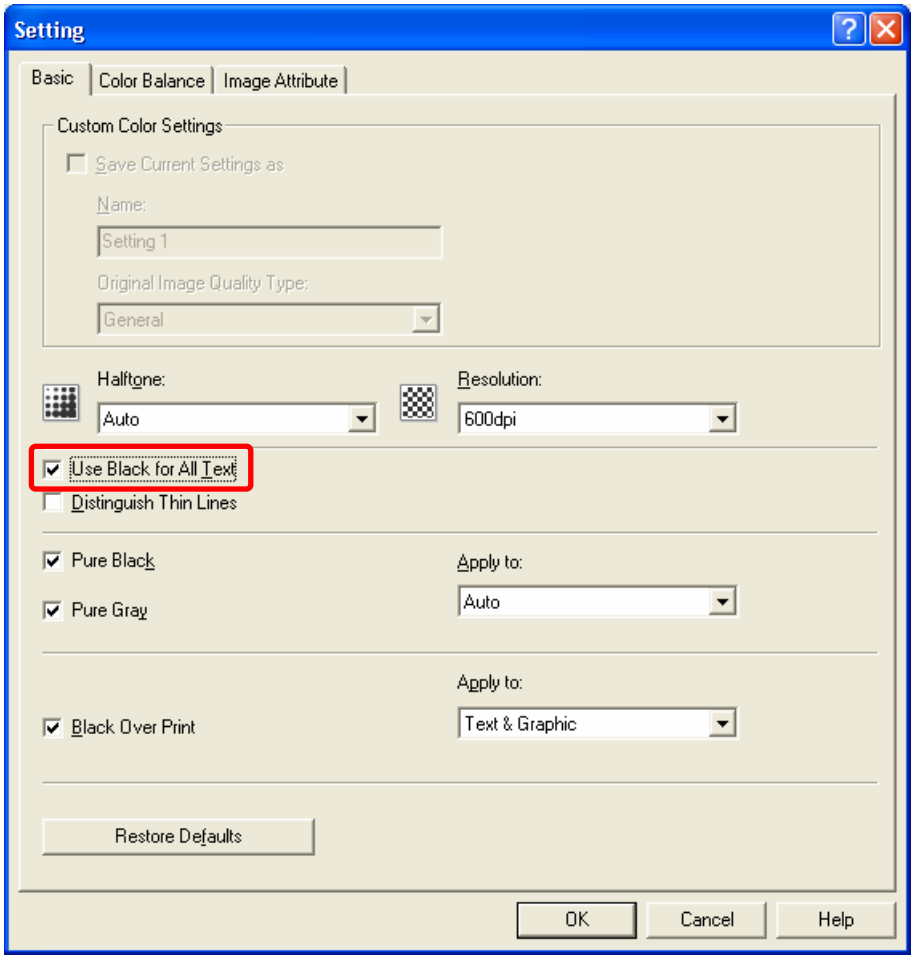
PCL6 PS3

(3) Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.
Mark the "Use Black for All Text" checkbox in the "Image Quality" tab.

* This adjustment will have an effect only on printing on a Windows PCL6 or PS3 or XPS emulation printer driver.
(This adjustment cannot be performed on a Macintosh printer driver.)

* This adjustment will be effective, only if a file created on a general application, such as Microsoft Office, is printed in PostScript (PS3). It may not be effective, if a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress) is printed, or a PDF file created on these applications is printed.



<Note> The adjustment may provide all colored text in black.

After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure, because text may not be defined as 100% black on the file.

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PCL6 PS3 XPS Mac * This adjustment will have an effect only on Black and white mode printing.

(4) Enter adjustment mode [05]. Change the values for codes [8210 to 8212] or [8249 to 8254] to adjust the threshold values for "Pure Gray" and "Pure Black" (to adjust the area to print only using the K toner).

• Adjust the value for [05] code corresponding to the print option to be applied (Apply to, PDL, Item, Subcode (Image quality type)).

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

Apply to	PDL	[05] code	Subcode	Recommended value	Acceptable value range	Default
Text	PCL6	05-8210	0/1/2/3	Set a value smaller than the default to decrease the area to print only using the K toner. Set a value larger than the default to increase the area to print only using the K toner.	1 to 255	8 / 8 / 8 / 8
	PS3	05-8252	0/1/2/3/4			8 / 8 / 8 / 8 / 8
	XPS	05-8249	0/1/2/3/4			8 / 8 / 8 / 8 / 8
Graphics	PCL6	05-8211	0/1/2/3			1 / 1 / 1 / 8
	PS3	05-8253	0/1/2/3/4			1 / 1 / 1 / 8 / 1
	XPS	05-8250	0/1/2/3/4			1 / 1 / 1 / 8 / 1
Image	PCL6	05-8212	0/1/2/3			1 / 1 / 1 / 8
	PS3	05-8254	0/1/2/3/4			1 / 1 / 1 / 8 / 1
	XPS	05-8251	0/1/2/3/4			1 / 1 / 1 / 8 / 1

* The subcode varies according to the Image quality type where the adjustment is performed. Refer to the table below and set the subcode for the Image quality type to adjust.

Subcode	Image Quality Type
0	General
1	Photograph
2	Presentation
3	Line Art
4	Color Profile

<Note> If the graphic and image options are changed, the adjustment may possibly cause the unnatural hue of gradational and photo images, and the inadequate reproducibility of gradations. Therefore, carefully perform the adjustment, while checking the printouts.

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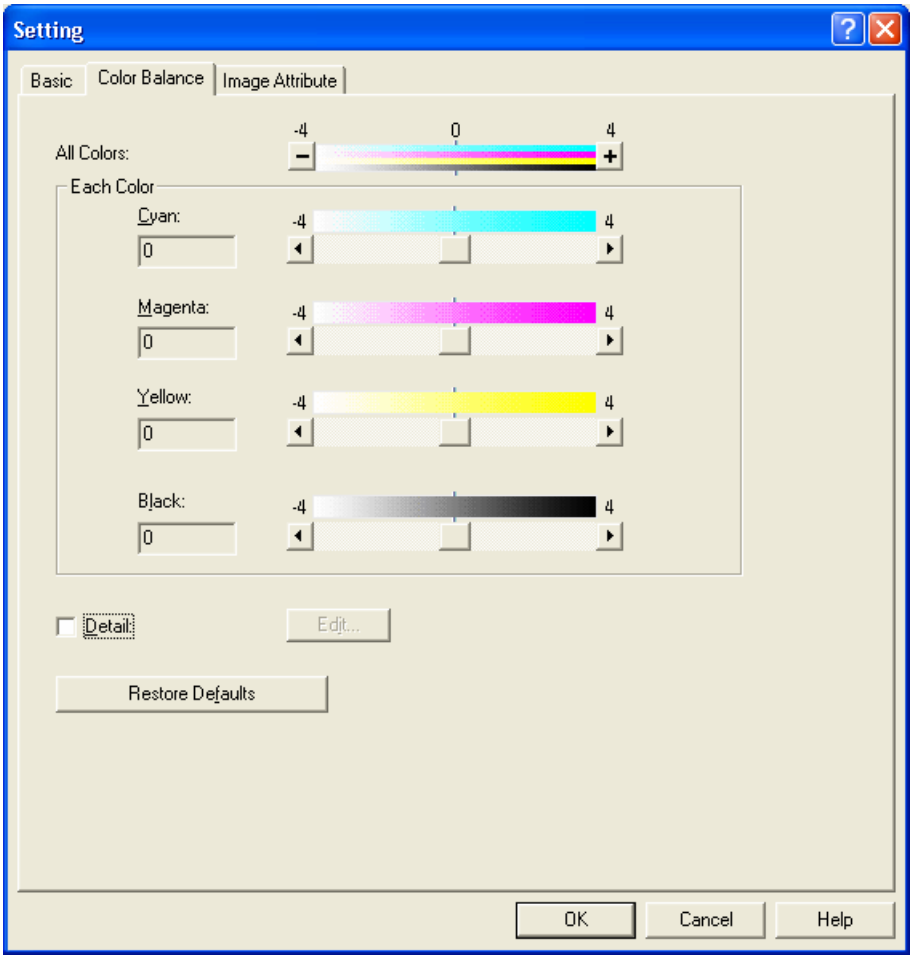
PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

(5) Open the property page of the printer driver and press [Setting] button in the "Image Quality" tab. Mark the "Detail" checkbox in the "Color Balance" tab and then press the [Edit] button.

• Set the value for the Low/Medium density of the color you would like to adjust within a range of "1" to "4" in the "Color Balance Details" option.

*This adjustment will have an effect only on printing on the Windows PCL6, PS3 or XPS emulation printer driver. (This adjustment cannot be performed on a Macintosh printer driver.)

* Initially, set "4" and check the printout.



After changing the option on the printer driver, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

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PCL6 PS3 XPS Mac * This adjustment will have an effect only on Black and white mode printing.

(6) Enter adjustment mode [05]. Change the values for codes [8042 to 8065] to adjust the color density (Color balance).

• Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL6, Image Quality Type = General, Halftone = Auto

> Text area, graphic area and image area

Change the values for Y: 05-8058, M: 05-8059, C: 05-8060 and K: 05-8061.

• When printing on Macintosh is performed with the following option selected: Image Type = Photograph, Halftone = Smooth

> Change the values for Y: 05-8050, M: 05-8051, C: 05-8052 and K: 05-8053.

*Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

*The hue of the black text printed using all color toners (C, M, Y and K) will look much clearer, if the amount of the C (cyan) toner used is larger than the M (magenta) or Y (yellow) toner. Remember that adjusting the density of K (black) does not affect the hue of the black text, if all color toners are used to print the text.

Color to adjust	PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	PCL6	Smooth	05-8058	0/1/2	Set a value larger than 128.	0 to 255	128
		Detail	05-8062	0/1/2			
	PS3	Smooth	05-8050	0/1/2			
		Detail	05-8054	0/1/2			
	XPS	Smooth	05-8042	0/1/2			
		Detail	05-8046	0/1/2			
M (Magenta)	PCL6	Smooth	05-8059	0/1/2			
		Detail	05-8063	0/1/2			
	PS3	Smooth	05-8051	0/1/2			
		Detail	05-8055	0/1/2			
	XPS	Smooth	05-8043	0/1/2			
		Detail	05-8047	0/1/2			
C (Cyan)	PCL6	Smooth	05-8060	0/1/2			
		Detail	05-8064	0/1/2			
	PS3	Smooth	05-8052	0/1/2			
		Detail	05-8056	0/1/2			
	XPS	Smooth	05-8044	0/1/2			
		Detail	05-8048	0/1/2			
K (Black)	PCL6	Smooth	05-8061	0/1/2			
		Detail	05-8065	0/1/2			
	PS3	Smooth	05-8053	0/1/2			
		Detail	05-8057	0/1/2			
	XPS	Smooth	05-8045	0/1/2			
		Detail	05-8049	0/1/2			

*Set the value in increments of approximately 20, while checking the printouts until the optimum value is obtained.

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* "Halftone" refers to how halftones are printed. Two options are available: "Smooth" which is intended to improve the reproducibility of gradation and "Detail" which is intended to print halftones in details (with the high frequency).
The halftone option to be applied in printing can be selected from among the "Halftone" options on the printer driver (Windows) or in the print dialog box (Macintosh).
"Auto" is selected from among the "Apply to" options by default. It is intended to automatically select "Smooth" or "Detail" in accordance with "Apply to" of the halftone option, the selected "Color" and "Image Quality Type" options, as described by the table below.

Apply to	"Color" and "Image Quality Type" options					
	Auto/Color				Black and White	Twin Color
	General	Photograph	Presentation	Line Art		
Text	Detail	Detail	Detail	Detail	Detail	Detail
Graphic (Illustration, line, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth
Image (Photograph, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note>

- This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the value for [05] code for PCL6 and Smooth is changed, it will be applied to printing performed with PCL6 and Halftone = "Smooth" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

- This code is commonly used in the Twin-color mode and the Color mode. After the adjustment, the values changed will be also applied to the image quality in the Color mode. When adjusting the image quality in the Twin-color mode, carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when performing printing in the Color mode.

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❑ Precautions after the completion of the adjustment

The adjustment may possibly change the hue of the text and the image, such as a photo image, on the printout. Therefore, carefully perform the adjustment, while checking the printouts.

❑ Remarks

To check the definition of black text

When creating a PDF file, 100% black may not be defined as follows, depending on the application settings:

"100% black" indicates the following values:

- RGB data: RGB = 0%
- CMYK data: CMY = 0%, K = 100%

As a result, text, which should be defined as 100% black on the application, is not defined as 100% black on the saved PDF file. (A small percent of color data is defined.) Eventually, all color toners (C, M, Y and K) will be used to print it.
If printing is performed on a PCL6 printer driver, print data are captured as RGB data. If black text is defined as 100% black (CMY=0%, K = 100%) for CMYK data on a PDF file, it will not be converted into 100% black (RGB = 0%) for RGB data on Acrobat, and it will be printed in colors. (It is recommended to print CMYK data on a PS3 printer driver instead of a PCL6 printer driver.)
Use "Output Preview" on Acrobat 7.0 Professional to examine the color definition on the PDF file.

* For further information regarding the Output Preview, refer to an appropriate manual or the Help menu of Acrobat 7.0 Professional.

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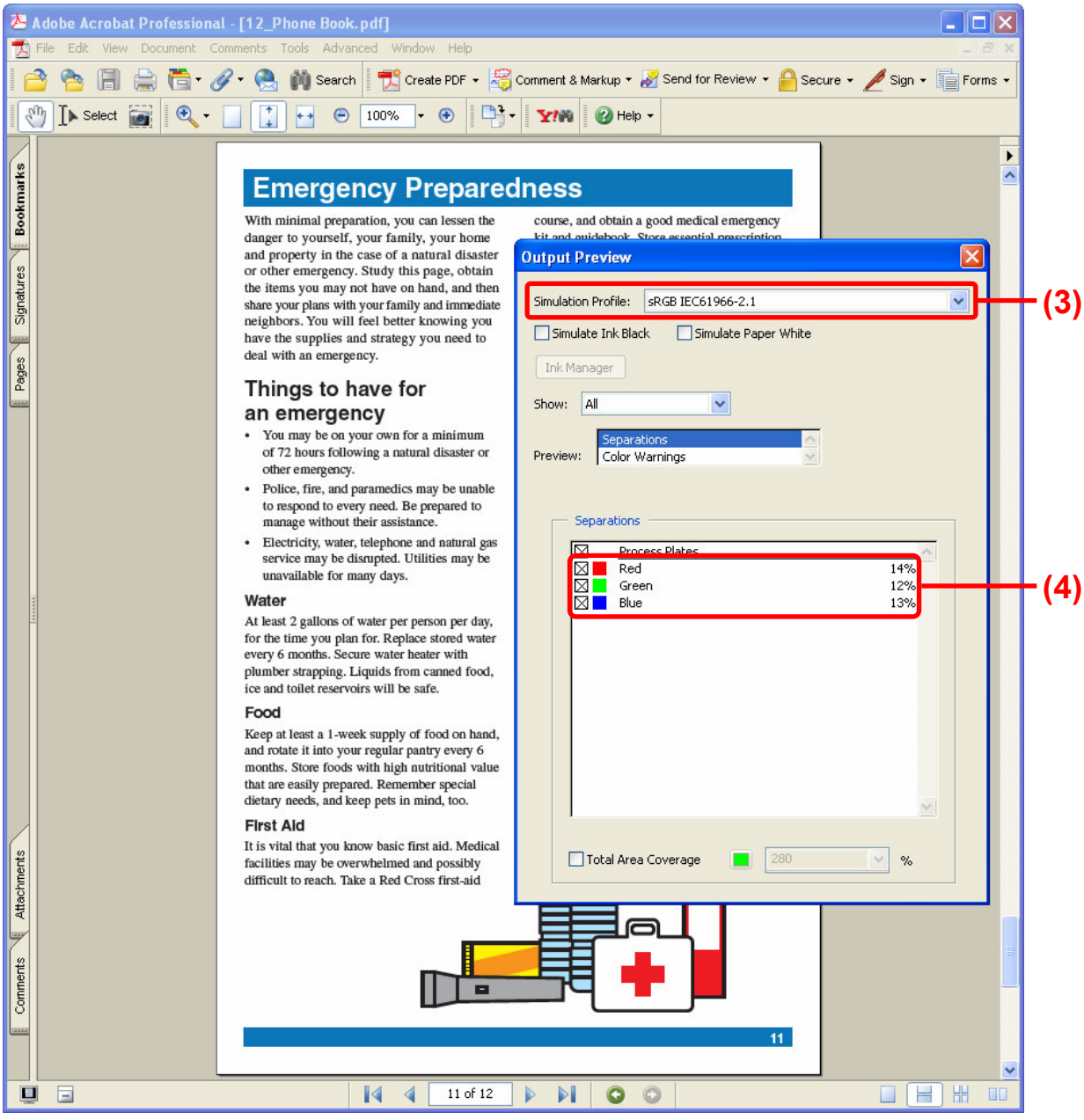
(1) Open a PDF file on Acrobat 7.0 Professional.

(2) Select "Output Preview" in the "Advanced" menu.

(3) Select a profile from among the "Simulation Profile" options.

* Select the profile to use for the Monitor Simulation, in order to print RGB data, and the one to use for the Ink Simulation, in order to print CMYK data from among the "Simulation Profile" options.

(4) Move the cursor over the data to check the color definition. Then the color calibration will be displayed in percentage on "Separations."



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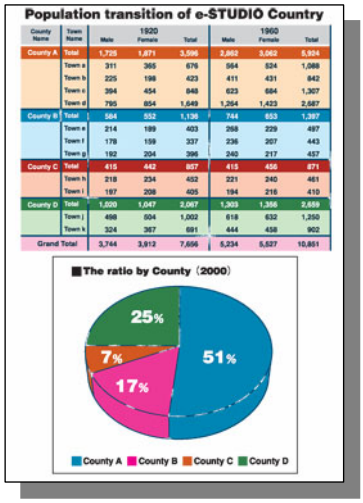
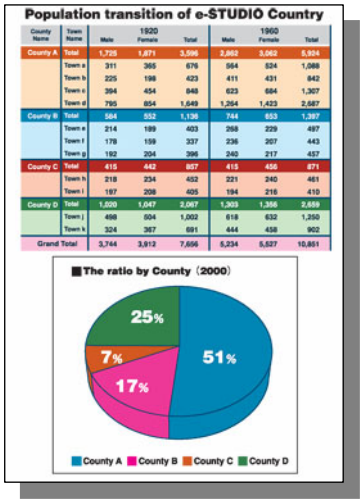
3.22 To Prevent Dark Toner from Coming Off

Before the adjustment



The dark toner comes off.

After the adjustment



The dark toner is securely fixed.

❑ Explanation

When highly colored lines, where a large accumulated amount of C, M, Y and K toners are used, are created on raster data (image), such as BMP, GIF, JPEG and TIFF, and printed on the rough surface of paper or thick paper, the toner may come off the paper. This is because the C, M, Y and K toners may be overlaid, the paper may be extremely thick or the surface may be rough, and the amount of toner used may be insufficient. Adjust the limit value of the maximum amount of toner used, in order to avoid a toner fixing problem.

This adjustment does not affect a single color of C, M, Y and K, or bright colors such as red and green.

❑ Procedures

* The service technician must perform all adjustments.

PCL6 PS3 XPS Mac * This adjustment will have an effect only on Auto or Color mode printing.

(1) Enter adjustment mode [05]. Decrease the values for code [8070] or [8071] to reduce the limit value of the maximum amount of toner used.

• Adjust the value for [05] code corresponding to the print option to be applied (Paper type and Halftone).

*Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

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Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
Smooth	05-8071	0/1/2/3/4/5/6/7/8/9	Set a value lsmaller than the default.	0 to 255	128
Detail	05-8070	0/1/2/3/4/5/6/7/8/9			

Subcode	Paper type
0	Plain paper
2	Recycled paper
3	Thick 1
4	Thick 2
5	Thick 3
6	Thick 4
7	Special 1
8	Special 2
9	OHP

* Set the value in increments of approximately 30, while checking the printouts until the optimum value is obtained.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause dark areas such as shades on photo images to look unnaturally faint. Therefore, carefully perform the adjustment, while checking the printouts.

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3.23 To Register the Image Quality Adjusted Corresponding to a Preference
(To use the Custom Color Settings)

❑ Explanation

The option to obtain the desired print image quality can be registered as Custom Color Settings.

* This adjustment will have an effect only on printing on a Windows PCL6 or PS3 or XPS emulation printer driver.
(This adjustment cannot be performed on a Macintosh printer driver.)

❑ Procedures

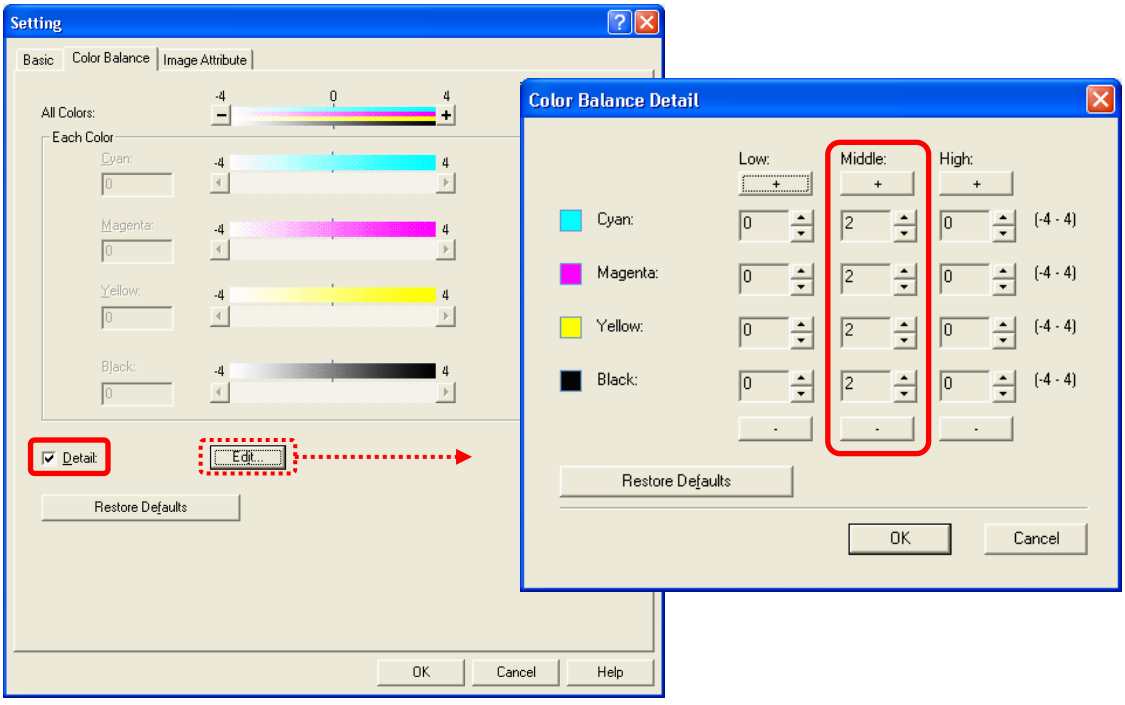
* Both the service technician and the user can perform all adjustments.

* As an example of using Customer Color Settings, if "Presentation" is selected as the base type from among the "Image Quality Type" options, the procedure below is to set a larger value for the Middle density of the color in the "Color Balance Details" option, and register the name of "Draft agenda."

PCL6 PS3 XPS

(1) Open the property page of the printer driver in the "Printers and Faxes" folder. Press the [Setting] button in the "Image Quality" tab. Change the options in the "Basic," "Color Balance" and "Image Attribute" tabs, in order to obtain the desired print image quality.

Ex: Mark the "Detail" checkbox in the "Color Balance" tab. Press the [Edit] button.
Set the value for the Middle density of the color in the "Color Balance Details" option.



After setting the values, use the procedure.

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PCL6 PS3 XPS

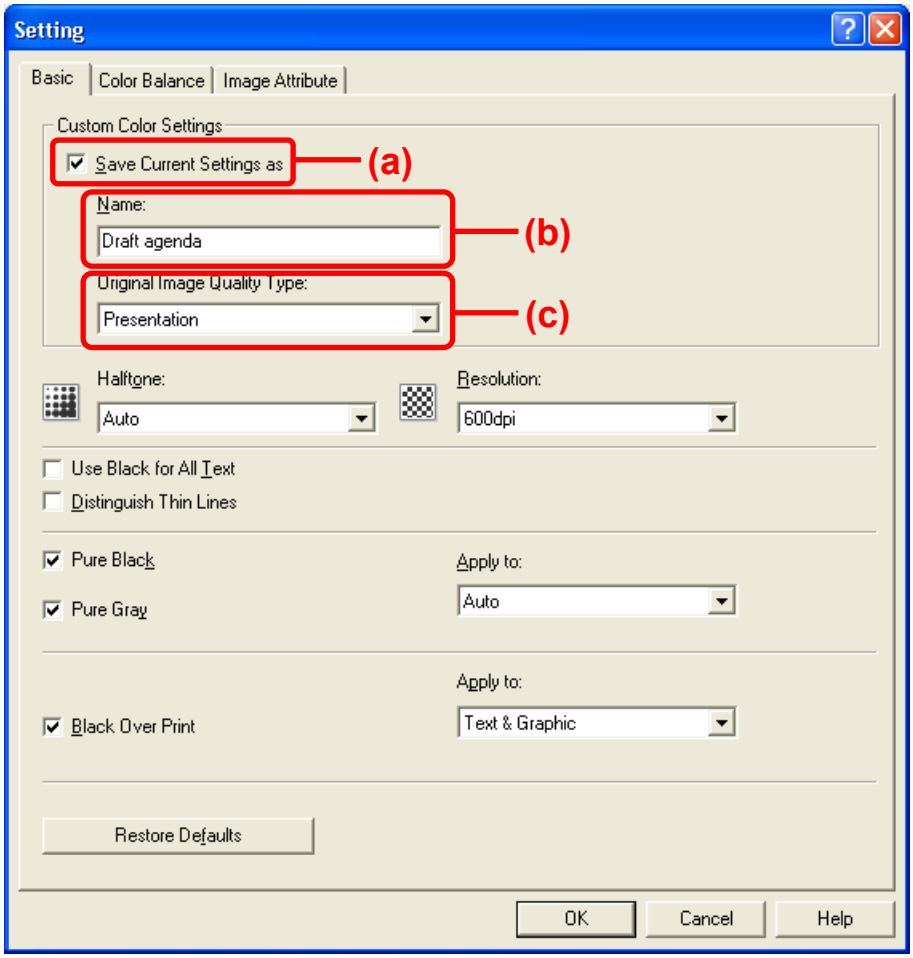
(2) Register the name for what has been specified in procedure (1), in the "Basic" tab in the "Setting" option.

• Use steps (a) to (c) to register the name.

(a) Mark the "Save Current setting as" checkbox in the "Custom Color Settings" option.

(b) Enter an optional name in the "Name" option.

(c) Select the type you would like to use as the base one from among the "Image Quality Type" options in "Original Image Quality Type."



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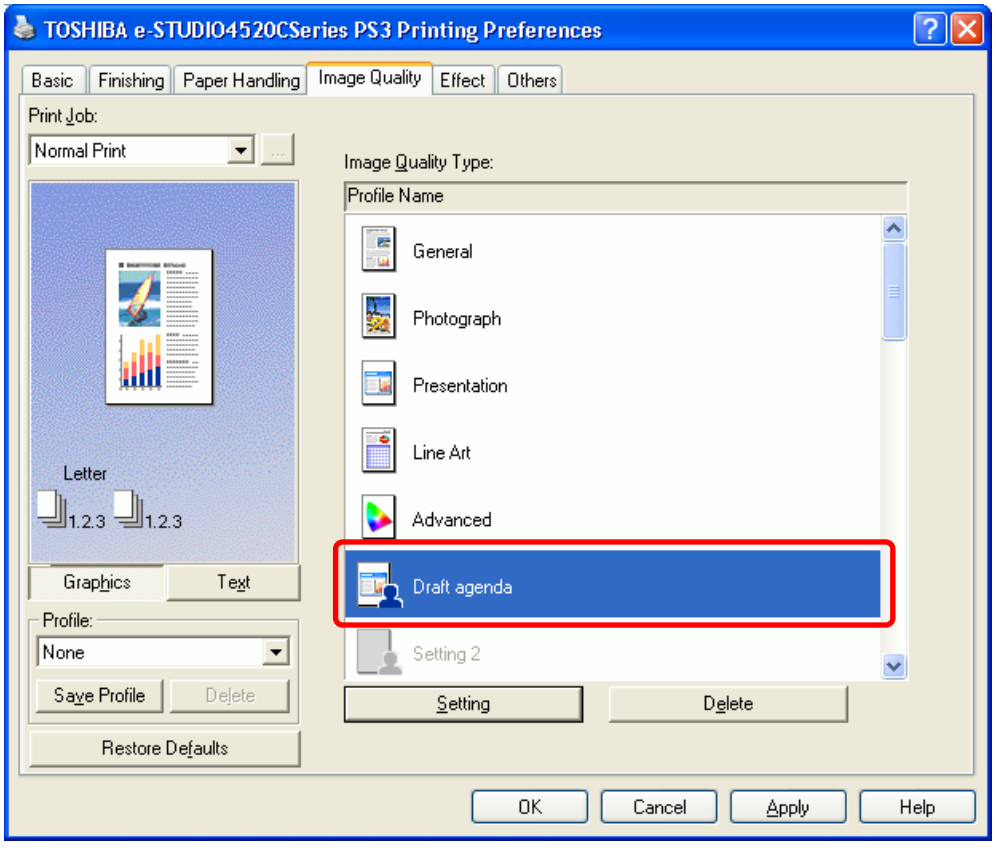
After registering the name, open the property page of the printer driver. Make sure that the name created for the "Image Quality Type" option in the "Image Quality" tab has been registered.

* The icon of the base "Image Quality Type" will be displayed in the background of the icons for the registered Custom Color Settings.
(The icon of "Presentation" is displayed in the background as illustrated below.)



❑ Precautions after the completion of the adjustment

The Custom Color Settings indicate a condition where the default setting has been changed.
Adjusting the values in detail in the "Setting" option allows the user to register the desired print image quality.

❑ Remarks

The checkbox in the "Custom Color Settings" option will be effective, only if you login using a user name belonging to Administrator or Power Users (only on Windows NT4.0 / 2000 / XP / Vista / Server 2003), and open the property page of the printer driver in the "Printers and Faxes" folder.

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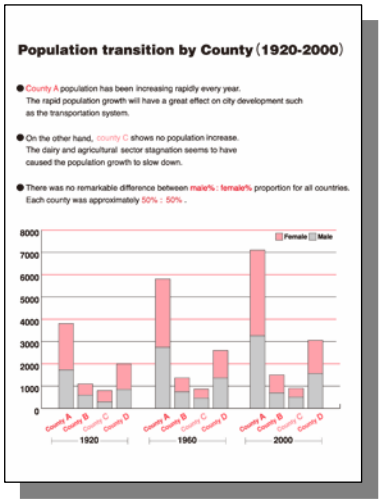
3.24 To Print a Full-Color Original in Two Colors

Before the adjustment

Population transition by County (1920-2000)
County A population has been increasing rapidly every year.
The rapid population growth will have a great effect on city development such as the transportation system.
On the other hand, county C shows no population increase.
The dairy and agricultural sector stagnation seems to have caused the population growth to slow down.
There was no remarkable difference between male% : female% proportion for all countries.
Each county was approximately 50% : 50% .
Female
Male
1920
1960
2000

The original is printed in the Full color mode.

After the Adjustment


Population transition by County (1920-2000)
County A population has been increasing rapidly every year.
The rapid population growth will have a great effect on city development such as the transportation system.
On the other hand, county C shows no population increase.
The dairy and agricultural sector stagnation seems to have caused the population growth to slow down.
There was no remarkable difference between male% : female% proportion for all countries.
Each county was approximately 50% : 50% .
Female
Male
1920
1960
2000

The areas other than black is printed in the same color (Red).

❑ Explanation

Select the twin color print mode option, in order to change colored text and lines on full-color original and print out the original.

* The Twin-color print mode particularly affects originals containing clear text and lines. It does not affect originals where gradations of photo images are required.

❑ Procedures

* The procedure to use varies depending on whether "To Adjust Colors", "To Adjust the Sharpness" or "To Print a Full-Color Original in Two Colors". Refer to the procedure corresponding to the particular user's request.

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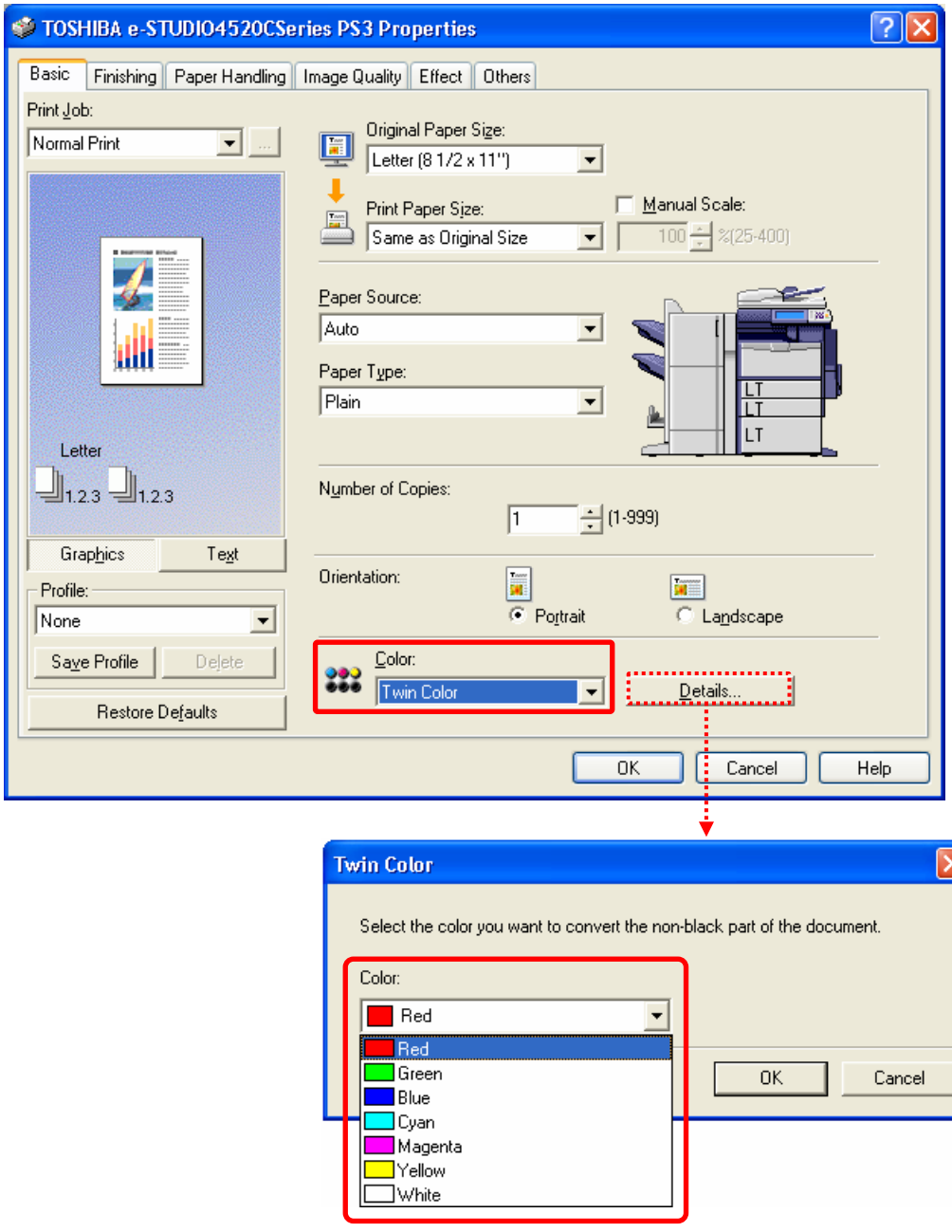
3.24.1 To Adjust Colors

(1) Select "Twin Color" from among the "Color" options on the printer driver.

For Windows

PCL6 PS3 XPS

Open the property page of the printer driver. Select "Twin Color" from among the "Color" options in the "Basic" tab. Press the [Details] button. Select the color to be used for the area other than black, from among the "Color" options.



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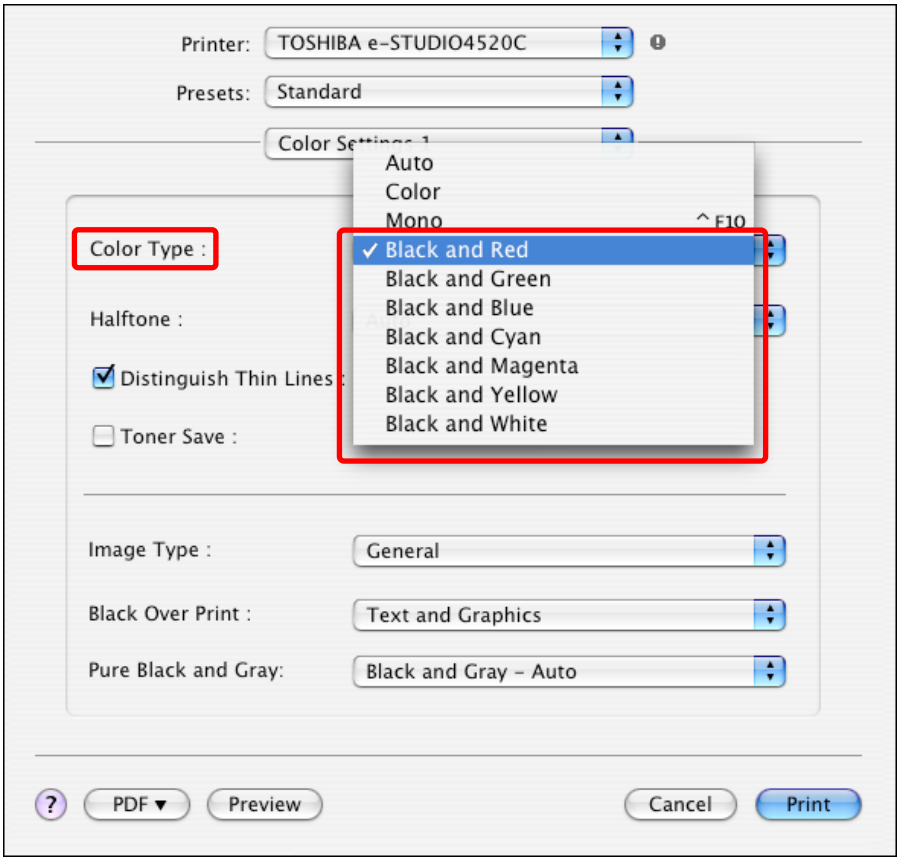
For Macintosh

Mac

Open the print dialog box. Select "Twin color (Black & ***)" from among the "Color Type" options.

*The menu to select varies according to the operating system. Refer to the table below and select the menu.

OS	Menu
10.2.x	"Printer Features" ⇨ "Feature Sets: Color settings 1" ⇨ "Color Type"
10.3.x / 10.4.x/10.5x	"Color Settings 1" ⇨ "Color Type"



After selecting these options, print and check the print image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure according to the image quality problem the user has.

- To obtain a shaper or softer print image: Go to procedure (2).
- To make only the light-colored area darker: Go to procedure (3).

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(2) Change the "Color balance" option on the printer driver.

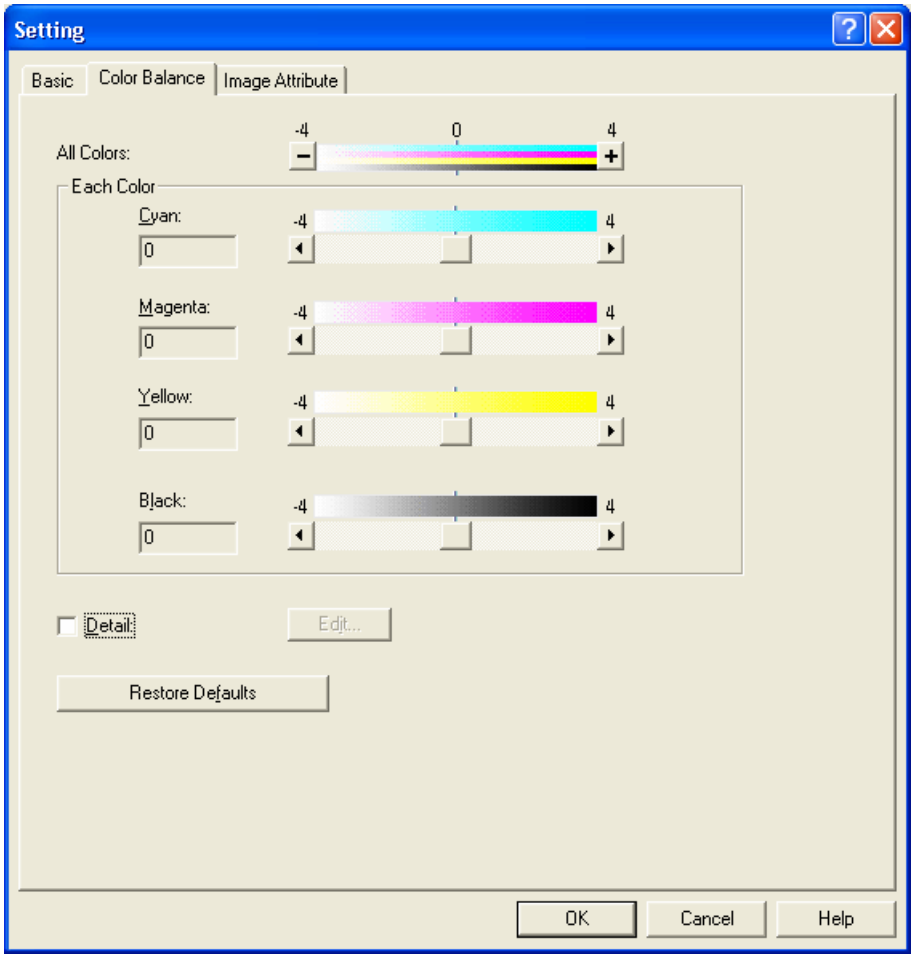
For Windows

PCL6 PS3 XPS * This adjustment will have an effect only on Auto or Color mode printing.

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab. Change the option in the "Color Balance" tab.

* Set the value, while checking the printouts until the optimum value is obtained.

- "Color Balance" tab: Change the "All Colors" or "Each Color" option.
- To make detailed setting, you can set it by marking "Detail" checkbox. (Same as Auto color or Full color mode)



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(3) Enter adjustment mode [05]. Change the values for codes [8042 to 8065] to adjust the color density.
- Adjust the value for [05] code corresponding to the print option to be applied (PDL and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL6, Color = Twin color, Details = RED, Halftone = Auto
> Text area
Change the values for Y: 05-8062, M: 05-8063 and K: 05-8065.
> Graphic and image area
Change the values for Y: 05-8058, M: 05-8059 and K: 05-8061.
• When printing on Macintosh is performed with the following option selected: Color Type = Black & Green, Halftone = Smooth
> Change the values for Y: 05-8050, C: 05-8052 and K: 05-8053.

* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

Color to adjust	PDL	Halftone	[05] code	Subcode	Recommended value	Acceptable value range	Default
Y (Yellow)	PCL6	Smooth	05-8058	0/1/2	Set a value larger than 128 to increase the density. Set a value smaller than 128 to decrease the density.	0 to 256	128
		Detail	05-8062	0/1/2			
	PS3	Smooth	05-8050	0/1/2			
		Detail	05-8054	0/1/2			
	XPS	Smooth	05-8042	0/1/2			
		Detail	05-8046	0/1/2			
M (Magenta)	PCL6	Smooth	05-8059	0/1/2			
		Detail	05-8063	0/1/2			
	PS3	Smooth	05-8051	0/1/2			
		Detail	05-8055	0/1/2			
	XPS	Smooth	05-8043	0/1/2			
		Detail	05-8047	0/1/2			
C (Cyan)	PCL6	Smooth	05-8060	0/1/2			
		Detail	05-8064	0/1/2			
	PS3	Smooth	05-8052	0/1/2			
		Detail	05-8056	0/1/2			
	XPS	Smooth	05-8044	0/1/2			
		Detail	05-8048	0/1/2			
K (Black)	PCL6	Smooth	05-8061	0/1/2			
		Detail	05-8065	0/1/2			
	PS3	Smooth	05-8053	0/1/2			
		Detail	05-8057	0/1/2			
	XPS	Smooth	05-8045	0/1/2			
		Detail	05-8049	0/1/2			

* Set the value in increments of approximately 20, while checking the printouts until the optimum value is obtained.

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* The color to be adjusted varies according to the color (color to be used for the area other than black) selected in the Twin-color mode. Refer to the table below and select the color to be adjusted.

Selected color	Color to be adjusted		
	Y (Yellow)	M (Magenta)	C (Cyan)
Red	✓	✓	
Green	✓		✓
Blue		✓	✓
Cyan			✓
Magenta		✓	
Yellow	✓		

* "Halftone" refers to how halftones are printed. Two options are available: "Smooth" which is intended to improve the reproducibility of gradation and "Detail" which is intended to print halftones in detail (with the high frequency).
The halftone option to be applied in printing can be selected from among the "Halftone" options on the printer driver (Windows) or in the print dialog box (Macintosh).
"Auto" is selected from among the "Apply to" options by default. It is intended to automatically select "Smooth" or "Detail" in accordance with "Apply to" of the halftone option, the selected "Color" and "Image Quality Type" options, as described by the table below.

Apply to	"Color" and "Image Quality Type" options					
	Auto/Color				Black and White	Twin Color
	General	Photograph	Presentation	Line Art		
Text	Detail	Detail	Detail	Detail	Detail	Detail
Graphic (Illustration, line, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth
Image (Photograph, etc.)	Smooth	Smooth	Smooth	Detail	Smooth	Smooth

* The subcode varies depending on the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

<Note> This adjustment changes the values set in the MFP. Therefore, it will affect every user who uses the printer by connecting it to the MFP. After the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the value for [05] code for Smooth is changed, it will be applied to printing performed with Halftone = "Smooth" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

❑ Precautions after the completion of the adjustment

If "White" is selected in the Twin-color mode, all areas other than black will not be printed. White toner will not be used to print these areas.

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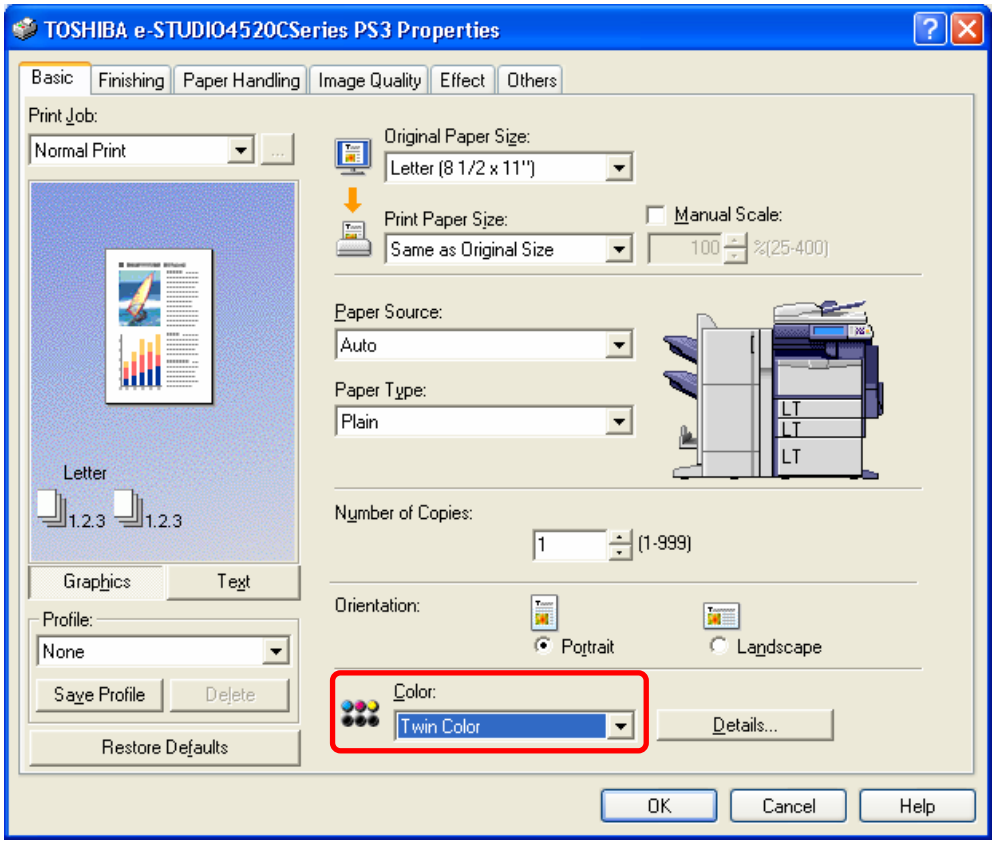
3.24.2 To Adjust the Sharpness

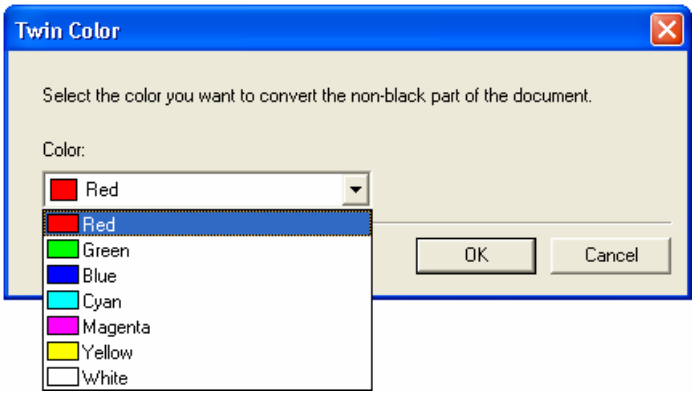
(1) Select "Twin Color" from among the "Color" options on the printer driver.

For Windows

PCL6 PS3 XPS

Open the property page of the printer driver. Select "Twin Color" from among the "Color" options in the "Basic" tab. Press the [Details] button. Select the color to use for the area other than black, from among the "Color" options.





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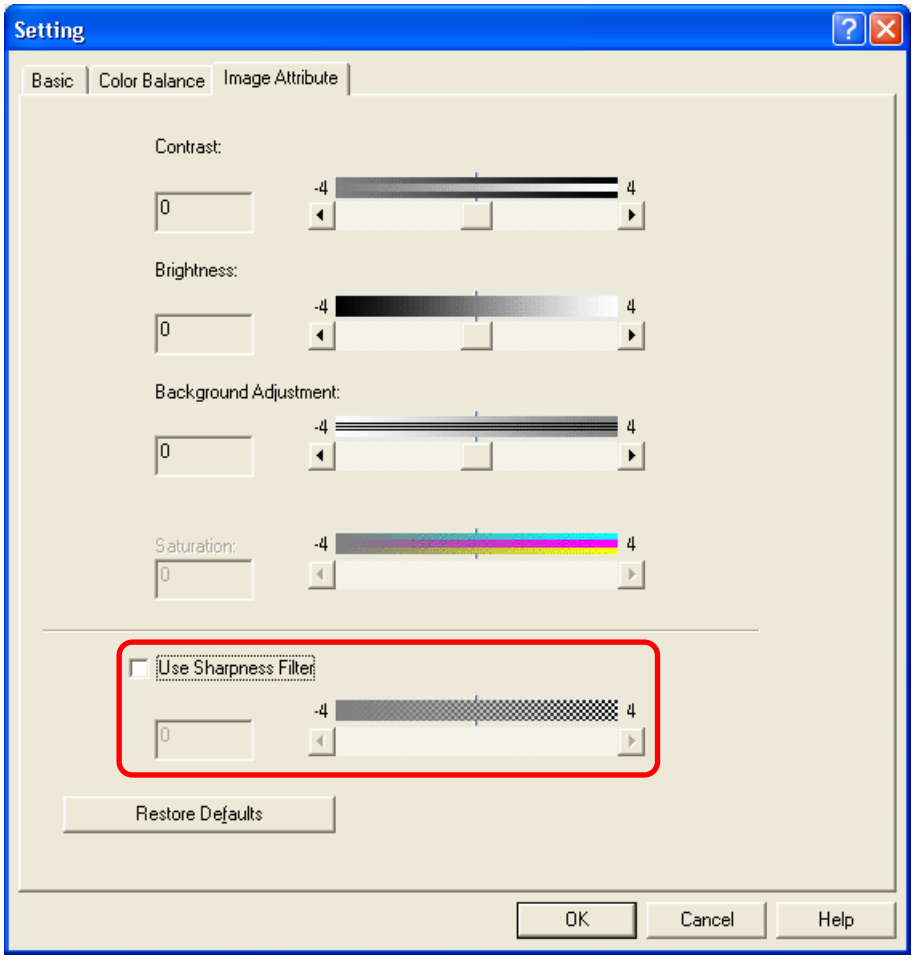
(2) Change the "Sharpness" option on the printer driver.

For Windows

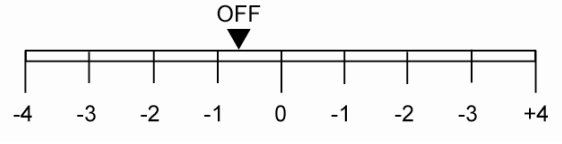
PCL6 PS3 XPS

Open the property page of the printer driver. Press the [Setting] button in the "Image Quality" tab.

Set the value for "Sharpness" within a range of "-4" to "4" or to "OFF" in the "Image Attribute" tab.



The value "OFF" of sharpness intensity adjustment is positioned as shown below.



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3.24.3 To Print a Full-Color Original in Two Colors

To adjust the boundary between black and colors other than black

(1) Enter adjustment mode [05]. Change the values for codes [8213 to 8215] to adjust the boundary between black and colors other than black.

* As the set value is increased, the area of "CHANGE BLACK TO" will become larger. On the other hand, if the value is decreased, the area of "SECOND COLOR" will become larger.

Apply to	[05] code	Recommended value	Acceptable value range	Default
Text	8213	Increase the set value to enlarge the black area.	1 to 255	8
Graphics	8214			1
Image	8215			1

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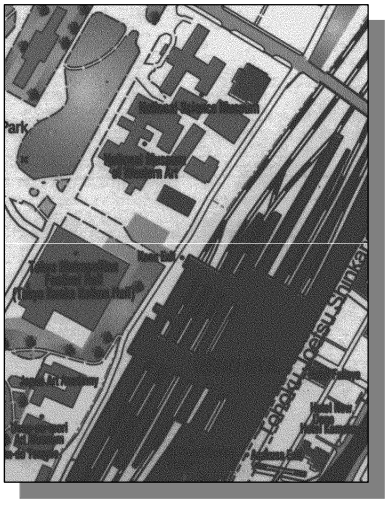
4.1 To Clearly Store a B/W Image in the Auto Color Mode

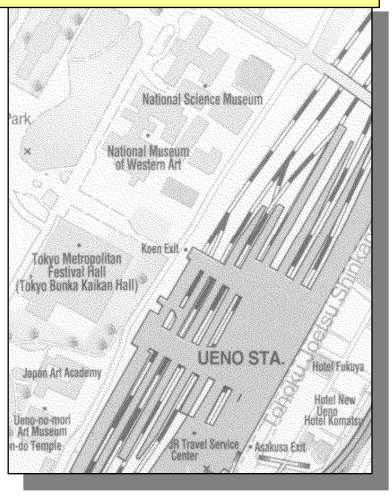
Before the adjustment



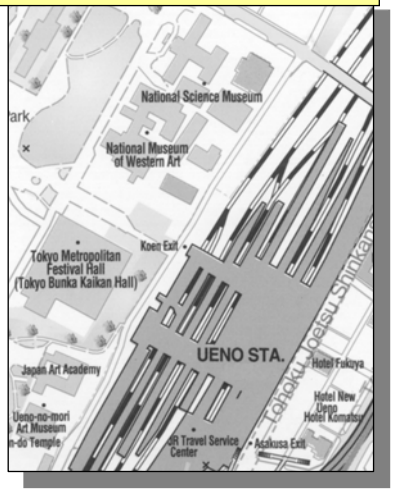
The light image becomes blurred and text becomes illegible.

After the adjustment

After the threshold value was adjusted



Stored in the Gray scale mode



Even the light image is not blurred. Text is clear and legible.

❑ Explanation

When a black-and-white original containing black-and-white photo images is scanned in the Auto color mode and stored in the e-Filing box (Scan to Box), it is stored with binary data, with reference to a threshold value. This may make a dark area blurred and a light area eliminated. Adjust the threshold value, in order to clearly store the black-and-white original in the Auto color mode.

* Please remember that the e-Filing functions are available only on the Windows platform, and not on the Macintosh or UNIX platform.

* This adjustment will have an effect on the image stored using Scan to File and Scan to E-mail.

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❑ Procedures

*Both the service technician and the user can perform all adjustments.

Scan to Box * This adjustment will have an effect only on images stored in the Auto color mode.

(1) This adjustment is effective when you scan an original judged as a black image at the most appropriate density level in the color modes.

• Use steps (a) to (d) to adjust the density.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] tab.

(c) Press the [SCAN] button.

(d) Press [◖] or [◗] of the “B/W ADJUSTMENT IN ACS” option to adjust the density level for scanning the original judged as a black image in the Auto color mode.

• If the density level is set to " ◖ ," the original will be stored with the low density.

• If the density level is set to " ◗ ," the original will be stored with the high density.

After adjusting the density, scan and store the original in the e-Filing box. Then check the image quality. Only if the user’s desired image quality is still not obtained after the density has been adjusted, use the next procedure.

Scan to Box * This adjustment will have an effect only on images stored in the Auto color mode.

(2) Select "HIGH QUALITY" from among the "IMAGE QUALITY FOR BLACK" options, to store the black-and-white original in the Gray scale mode.

• Use steps (a) to (d) to select the "IMAGE QUALITY FOR BLACK" option.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] tab.

(c) Press the [SCAN] button.

(d) Press the [HIGH QUALITY] button in the "IMAGE QUALITY FOR BLACK" option.

❑ Precautions after the completion of the adjustment

All scanning functions are implemented with reference to the density and the "IMAGE QUALITY FOR BLACK" option. They will affect the image quality of black-and-white originals stored in the Auto color mode. Therefore, carefully perform the adjustment, being aware that the image quality of all future images will be changed, when storing originals other than the one that is used for the adjustment.

❑ Remarks

• If "HIGH QUALITY" is selected from among the "IMAGE QUALITY FOR BLACK" options and black-and-white originals are scanned in the Auto color mode and stored in the e-Filing box (Scan to Box), this allows them to be stored in the Gray scale mode rather than in the binary mode, and eventually provides better halftones. The data will increase in size, compared to those in the binary mode.

• The adjustment of density will be effective, only if "STANDARD" is selected from among the "IMAGE QUALITY FOR BLACK" options.

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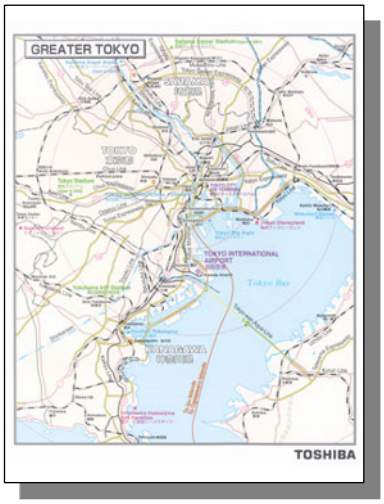
4.2 To Store an Original while Reducing the File Size

Before the adjustment

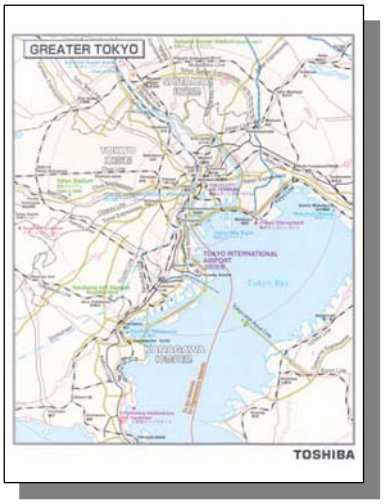
Ex.: A4, 200 dpi, LOW = Approx. 1000 KB



When "LOW" is from among the compression rate options, the file size will become larger than required.

After the adjustment

Ex.: A4, 200 dpi, HIGH = Approx. 400 KB



When "HIGH" is from among the compression rate options, the file size will be reduced.

❑ Explanation

When an original is scanned in the Full color or the Gray scale mode and stored in the e-Filing box (Scan to Box), it will be compressed into JPEG format. The data compression rate can be selected on a job-by-job basis. The file size significantly varies depending on the selected data compression rate. (When "LOW" is selected from among the compression rate options, the file size will be 2 to 3 times larger than the one when "HIGH" is selected.) When storing the original, if a higher priority is given to file size reduction than the image quality, change the compression rate.

* Please remember that the e-Filing functions are available only on the Windows platform, and not on the Macintosh or UNIX platform.

* This adjustment will have an effect on images stored using Scan to File and Scan to E-mail.

❑ Procedures

* Both the service technician and the user can perform all adjustments.

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Scan to Box * This adjustment will have an effect only on images (JPEG format) stored in the Full color mode (including the Auto color mode) or the Gray scale mode.

(1) Select "HIGH" from among the compression rate options.
* "MID" is selected from among the compression rate options by default.

* The procedure to use varies, depending on whether to select the compression rate on a job-by-job basis (without utilizing the template), utilize the template, or change the default compression rate. Refer to "To select the compression rate on a job-by-job basis" in order to store an image at a high compression rate for a particular job. Refer to "To utilize the template" in order to select an appropriate compression rate, corresponding to the type of original to store and the purpose of the image stored. Refer to "To change the default compression rate" in order to have "HIGH" selected from among the compression rate options by default.

To select the compression rate on a job-by-job basis (without utilizing the template)

When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "HIGH" from among the COMPRESS options.

To utilize the template

Recall the template where "HIGH" is selected from among the compression rate options and scan the original.

* The user may want to select a compression rate, depending on the type of original or purpose of the image stored. In this case, it is recommended to utilize the template. Initially, select the desired compression rate in the template and recall it as necessary. This facilitates changing the compression rate on a job-by-job basis. For further information regarding the template and its use, refer to the Operator's Manual for Scanning Guide and TopAccess Guide.

To change the default compression rate

Use steps (a) to (d) to change the default compression rate.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [USER] tab.
(c) Press the [SCAN] button.
(d) Press the [HIGH] button in the "COMPRESS" option.

❑ Precautions after the completion of the adjustment

Changing the default compression rate of the scanning functions will affect the quality of originals, which will be stored in the Full color (including the Auto color) or the Gray scale mode. Carefully perform the adjustment, being aware that the image quality of all future images will be changed, when storing originals other than the one that is used for the adjustment.

❑ Remarks

If the full-color or gray-scale image is copied or printed and stored in the e-Filing box (Copy to Box or Print to Box), the user can select a desired compression rate, when downloading the image using File Downloader on a client PC.

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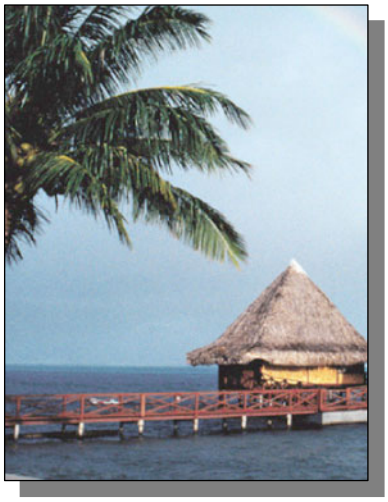
4.3 To Store a Color Photo Image, while Minimizing Moiré

Before the adjustment

When the magazine article containing full-color photo images is stored in the Photo mode, moiré is likely to occur.

After the adjustment



Storing it in the Printed image mode will reduce moiré.

❑ Explanation

When an original, such as a magazine article containing full-color photo images, is copied in the Full color mode, with the Photo mode selected, and stored in the e-Filing box (Copy to Box), moiré is likely to occur on the photo images. It may also occur, when it is copied on paper. But it will be more enhanced, if it is stored as image data. Select the Printed image mode from among the original mode options, in order to store full-color photo images, while minimizing moiré,

* Please remember that the e-Filing functions are available only on the Windows platform, and not on the Macintosh or UNIX platform.

❑ Procedures

* Both the service technician and the user can perform all adjustments.

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Copy to Box * This adjustment will have an effect only on images stored in the Full color mode.

(1) Press the [BASIC] tab on the Touch Panel and then select "PRINTED IMAGE" from the original modes.

* The procedure to be used varies depending on cases; when the original mode is set for each job (set without templates), when a template is used or when the default original mode is changed. If you want to scan only a particular job in the Printed image mode, refer to "To Set Original Mode for Each Job (without Templates)". If you change the original mode according to the type or the purpose of the original, refer to "To Scan Originals Using Template". If you change the default original mode in order to scan the original in the Printed image mode automatically, refer to "To Change Default Original Mode".

To Set Original Mode for Each Job (without Templates)

Press the [BASIC] tab on the Touch Panel and select [PRINTED IMAGE] as an original mode.

To Scan Originals Using Template

Recall a template whose original mode is set at "PRINTED IMAGE" to make a copy.

* It is recommended to use a template if you want to change the original mode setting according to the type or the purpose of the original to be scanned. First you must register the original mode settings as a template, then use it as required so that you will be able to switch the original mode easily. For how to use templates or details about templates, refer to the Copying Guide and the TopAccess Guide.

To Change Default Original Mode (on Touch Panel)

Use steps (a) to (d) to change the default original mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [USER] tab.
(c) Press the [COPY] button.
(d) Press the [PRINTED IMAGE] button of the "ORIGINAL MODE FOR COLOR" option.

To Change Default Original Mode (in Setting Mode [08])

Enter the setting mode [08]. Change the value for the code [585] to "2" to change the default original mode (a mode automatically selected when the power of the equipment is turned ON) to "PRINTED IMAGE".

Setting value of 08-585	Original mode at power-ON
0	Text/Photo (Default)
1	Text
2	Printed image
3	Photo
4	Map
5	Custom

❑ Precautions after the completion of the adjustment

The new default original mode in the copying function will be applied to all types of originals scanned with the default setting of the Full color mode. Therefore perform the adjustment carefully while checking the copied images other than the one used as a reference of the adjustment.

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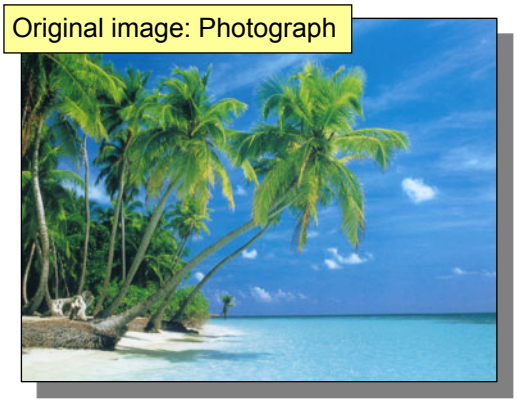
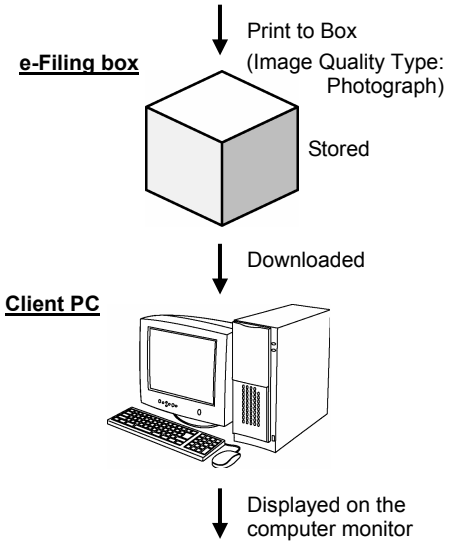
4.4 To Match the Color Balance on the Original

(To adjust the color balance in Print to Box)

Before the adjustment

Original image: Photograph

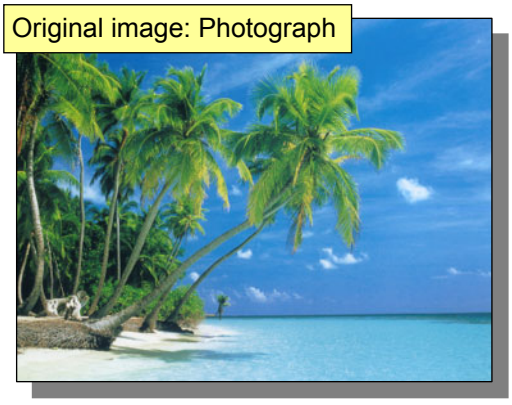


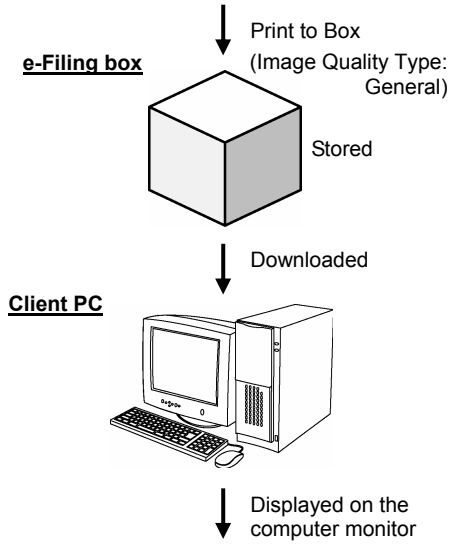


The image stored in the e-Filing box looks different in the color balance from the original.

After the adjustment

Original image: Photograph





The color balance of the image stored is closely matched with that of the original.

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❑ Explanation

If a full-color image is printed on a client PC and stored in the e-Filing box (Print to Box), it will be optimized for printing on paper. This is the reason why the image stored in the e-Filing box looks slightly different in the color balance from the original displayed on the computer monitor. Change the "Image Quality Type" setting on the printer driver, in order to minimize the difference in the color balance and closely match the color balance of the image stored with that of the original.

* Please remember that the e-Filing functions are available only on the Windows platform, and not on the Macintosh or UNIX platform.

❑ Procedures

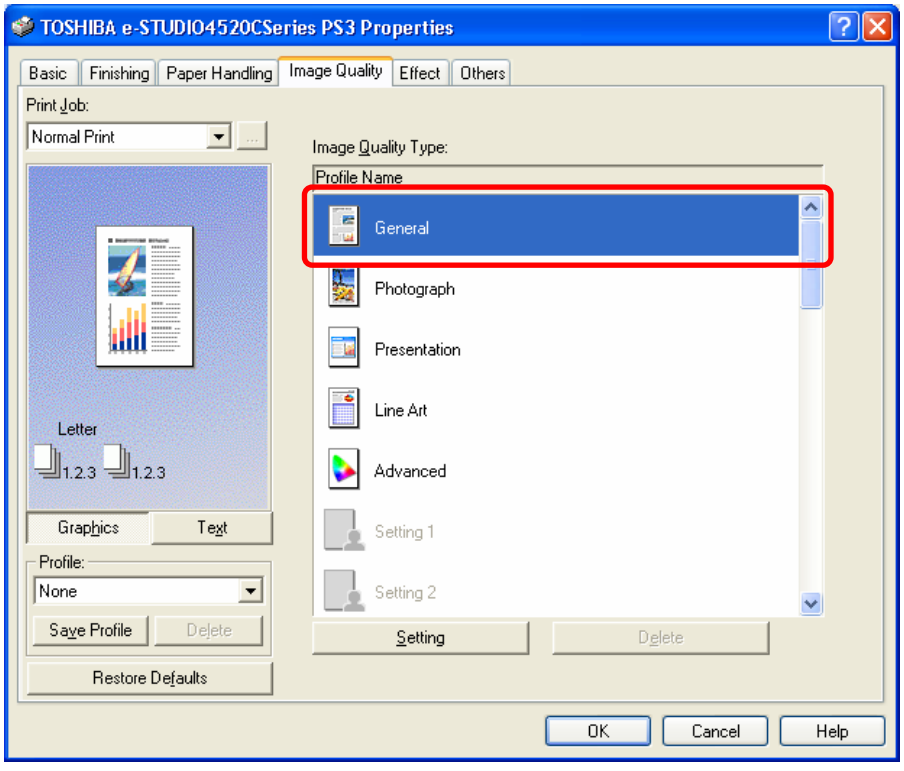
* Both the service technician and the user can perform all adjustments.

Print to Box | PCL5c | PS3 | XPS

* This adjustment will have an effect only on the image stored in the Auto mode or the Color mode.

(1) Open the property page of the printer driver. Select "General" from among the "Image Quality Type" options in the Image Quality tab.

* "General" allows the image to be stored in colors, which are closely matched with the original, compared to the other Image Quality Type options.



❑ Precautions after the completion of the adjustment

Nothing in particular.

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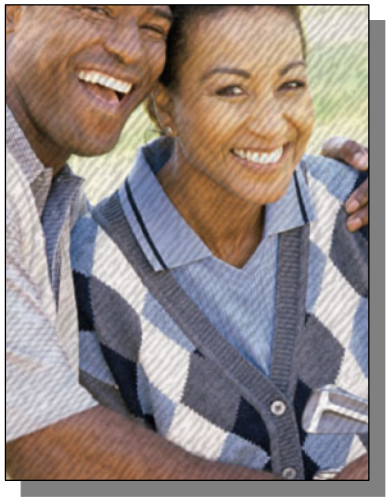
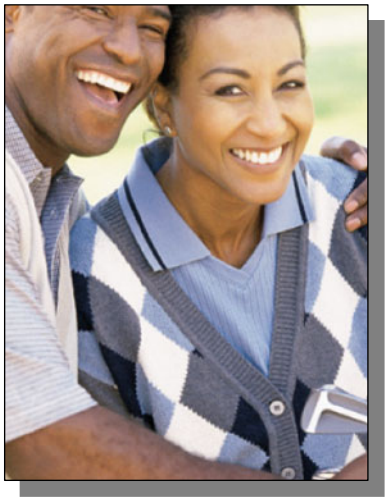
4.5 To Scan and Print, while Minimizing Moiré

Before the adjustment



When the image stored in the e-Filing box is printed, moiré is likely to occur.

After the adjustment



The image stored in the e-Filing box can be printed, while moiré is minimized.

❑ Explanation

An original is scanned and stored in the e-Filing box (Scan to Box). When the image stored is printed directly from the e-Filing box, moiré may occur, depending on the type of original. Also, it is likely to occur, particularly when the original is scanned in the Full color mode or the Auto color mode in a high resolution (600 dpi) or even in the Gray scale mode. Select an appropriate scan resolution or adjust the sharpness intensity in the scanning functions, in order to store the original and print it from the e-Filing box, while minimizing moiré.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedures (1) to (3).
* Only the service technician must use procedure (4).

Scan to Box

(1) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "PRTD IMAGE" from among the original mode options.

* This adjustment will be effective, only if "TEXT" or "PHOTO" is initially selected from among the original mode options.

* This adjustment will have an effect only on the image stored in the Full color mode (including the Auto color mode).

After changing the original mode, scan and store the original. Then print and check the print image quality. If further image quality adjustments are still necessary, use other procedures.

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Scan to Box

(2) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select a lower resolution in the resolution option.

* "200 (dpi)" is selected from among the resolution options by default. If moiré occurs in a resolution of 200 dpi, select a lower resolution (150 dpi is recommended.).

After changing the resolution, scan and store the original. Then print and check the print image quality.
If you do not prefer to decrease a resolution, or if moiré still occurs even in a lower resolution, use other procedures.

Scan to Box

(3) When scanning, press the [COMMON SETTING] button on the Control Panel. Adjust the sharpness intensity.

• Press the [+] button on the indicator to increase the sharpness intensity or the [-] button to decrease it.

* The sharpness intensity is set to the center (±) by default. If moiré occurs by default, press the [-] button to decrease the sharpness intensity.

After adjusting the sharpness intensity, scan and store the original. Then print and check the print image quality.
With the sharpness intensity set to the minimum, if moiré still occurs, use other procedures.

Scan to Box

(4) Enter adjustment mode [05]. Change the values for codes [1086 to 1088] and [843] to adjust the sharpness intensity in the scanning functions.

* This adjustment will have an effect only on an image stored in the Full color mode or the Gray scale mode.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Full color	Text	05-1086	Set a value smaller than 128.	0 to 255	128
	Printed image	05-1087			
	Photo	05-1088			
Gray scale	---	05-843			
Black	Text/Photo	05-840			
	Text	05-841			
	Photo	05-842			

* Setting "0" provides the softest image, while setting "255" provides the sharpest image.

❑ Precautions after the completion of the adjustment

When the original containing text and lines is scanned and printed, the adjustment may possibly cause the blurred text and lines or a blend of undesired colors. Therefore, carefully perform the adjustment, while checking the scanned-in image or printout.

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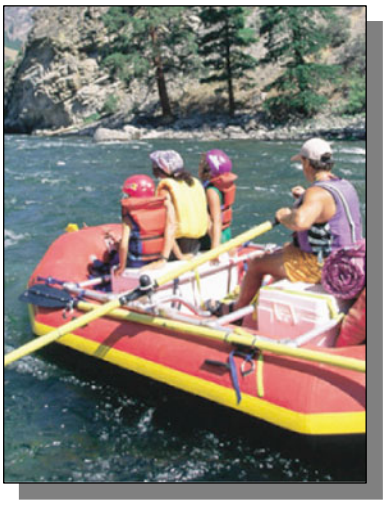
4.6 To Finely Print the Image Stored in the e-Filing box

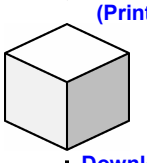
(To print images stored through Copy to Box or Print to Box)

Before the adjustment



Copy to Box,
Print to Box
(Print data)

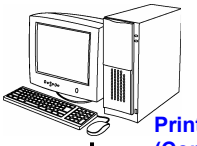
e-Filing box



Stored

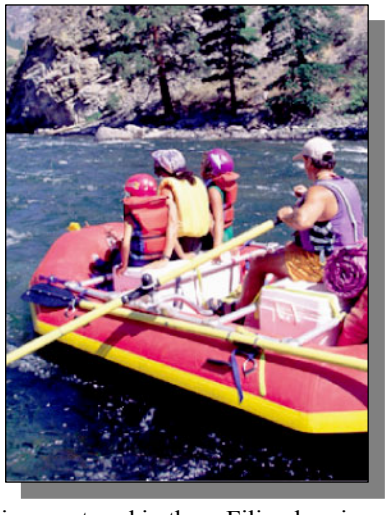
Downloaded
(Converted into RGB)

Client PC



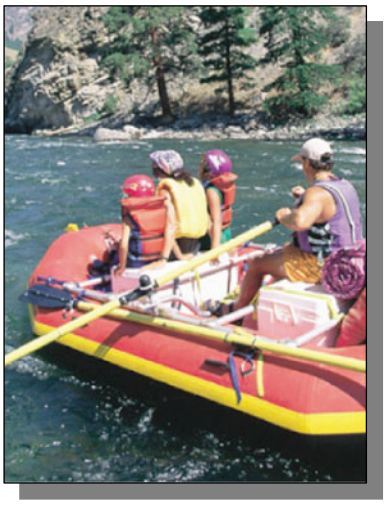
Stored

Print
(Converted into
print data again)



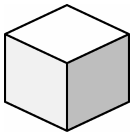
If the image stored in the e-Filing box is downloaded to a PC and then printed out, the image data conversion may diminish the image quality.

After the adjustment



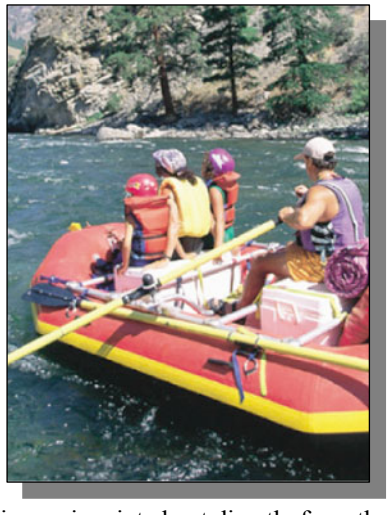
Copy to Box,
Print to Box
(Print data)

e-Filing box



Stored

Print
(Print data)



If the image is printed out directly from the e-Filing box, the image quality will be maintained.

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❑ Explanation

Initially, the original is copied or printed and stored in the e-Filing box (Copy to Box or Print to Box) as CMYK data or optimized for printing on paper. While it is being downloaded to a client PC using File Downloader or the TWAIN driver, it is converted into RGB data or optimized for displaying on the computer monitor. RGB data are not suitable for printing on paper. Therefore, if printed out, the image quality may be diminished. Therefore, it should be printed out directly from the e-Filing box, rather than downloaded to the PC, in order to obtain a fine printout.

* Please remember that the e-Filing functions are available only on the Windows platform, and not on the Macintosh or UNIX platform.

❑ Procedures

* Both the service technician and the user can perform all adjustments.

Copy to Box Print to Box

(1) Print out the image stored in the e-Filing box on the Control Panel or using the e-Filing Web utility.
* For further information regarding how to print it out, refer to the Operator's Manual for e-Filing Guide.

<Note> Scan to Box Fax to Box

If the image is scanned or faxed and stored in the e-Filing box (Scan to Box or Fax to Box), download it to the client PC once, select the desired Image Quality Type option on the printer driver, and print it out, rather than printing it out directly from the e-Filing box. Then, the image may be finely printed.
For further information regarding how to print full-color images scanned and stored, refer to 4.8 To Finely Print Color Images Scanned and Stored.

❑ Precautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

When "Archive Document" of the e-Filing Web utility or "Backup" of the e-Filing Backup/Restore Utility is used, image data stored in the e-Filing box can be converted to a file maintaining the image quality optimized for printing. For example, you may want to temporarily move stored data to make some space in the box and save them again in the box. When data are converted to a PDF or TIFF file and then moved using the File Downloader, the image quality may be diminished. However, you can use Archive Document or Backup to move the data while maintaining the image quality. The Backup feature can also collectively backs up all the data in the e-Filing box. Note that files created through the Archive Document or Backup feature cannot be directly opened on the PC or printed out. For further information regarding Archive Document and Backup, refer to the e-Filing Guide and Backup/Restore Utility.

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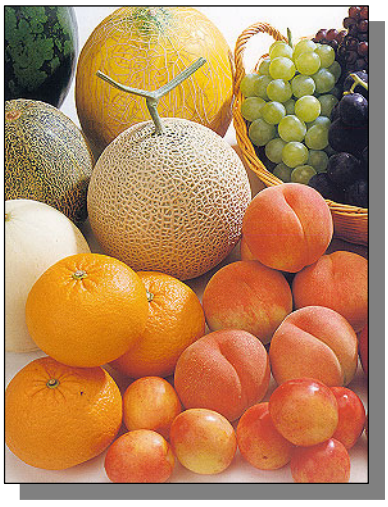
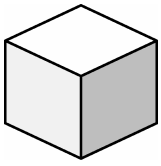
4.7 To Store an Image Suitable for Displaying on the Monitor or Image Editing

Before the adjustment



Copy to Box
(Print data)

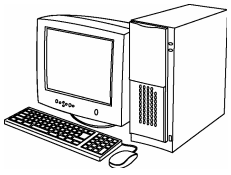
e-Filing box



Stored

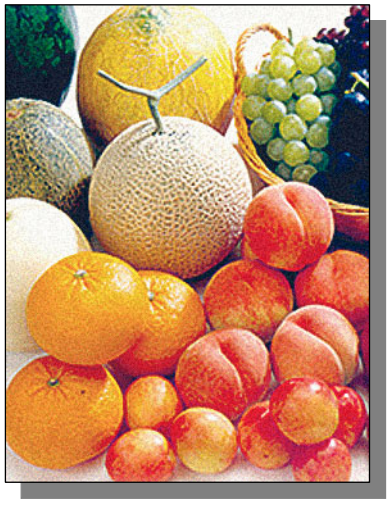
Downloaded
(Converted into RGB)

Client PC



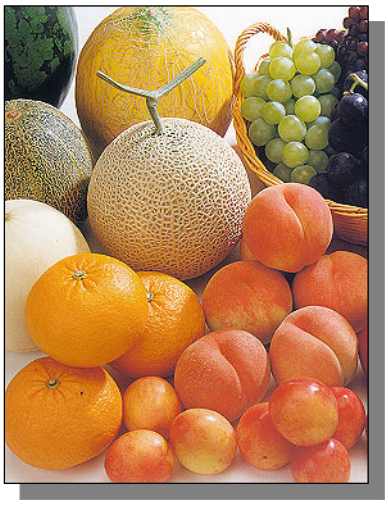
Stored and edited

Displayed on the computer monitor
(RGB data)



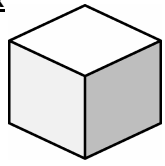
When the original is stored by Copy to Box, it will be converted into RGB data, while being downloaded to a PC. This may diminish the image quality.

After the adjustment



Scan to Box
(RGB data)

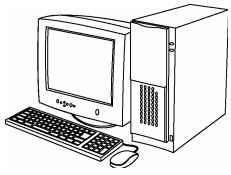
e-Filing box



Stored

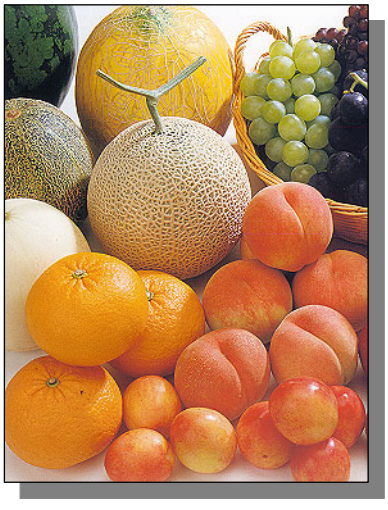
Downloaded
(RGB data)

Client PC



Stored and edited

Displayed on the computer monitor
(RGB data)



The original is stored as RGB data by Scan to Box. This can avoid unnecessary data conversion. As a result, the image quality can be maintained.

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❑ Explanation

Initially, a full-color original is copied and stored in the e-Filing box (Copy to Box) as CMYK data or optimized for printing on paper. But while it is being downloaded to a client PC using the File Downloader or the TWAIN driver, it is converted into RGB data or optimized for displaying on the computer monitor. Depending on the type of original, this CMYK-to-RGB conversion may cause out-of-registration colors or graininess on the printout. If the image is displayed on the monitor and further edited on the PC, the image quality may be diminished.

To store a full-color original and display it on the computer monitor, while minimizing image degradation, scan and store it in the e-Filing box (Scan to Box). This allows it to be stored as RGB data.

* Please remember that the e-Filing functions are available only on the Windows platform, and not on the Macintosh or UNIX platform.

❑ Procedures

* Both the service technician and the user can perform all adjustments.

Scan to Box * This adjustment will have an effect only on the image stored in the Full color mode (including the Auto color mode).

(1) Scan the full-color image and store it in the e-Filing box.

* For further information regarding how to scan and store images, refer to the Operator's Manual for e-Filing Guide and Scanning Guide.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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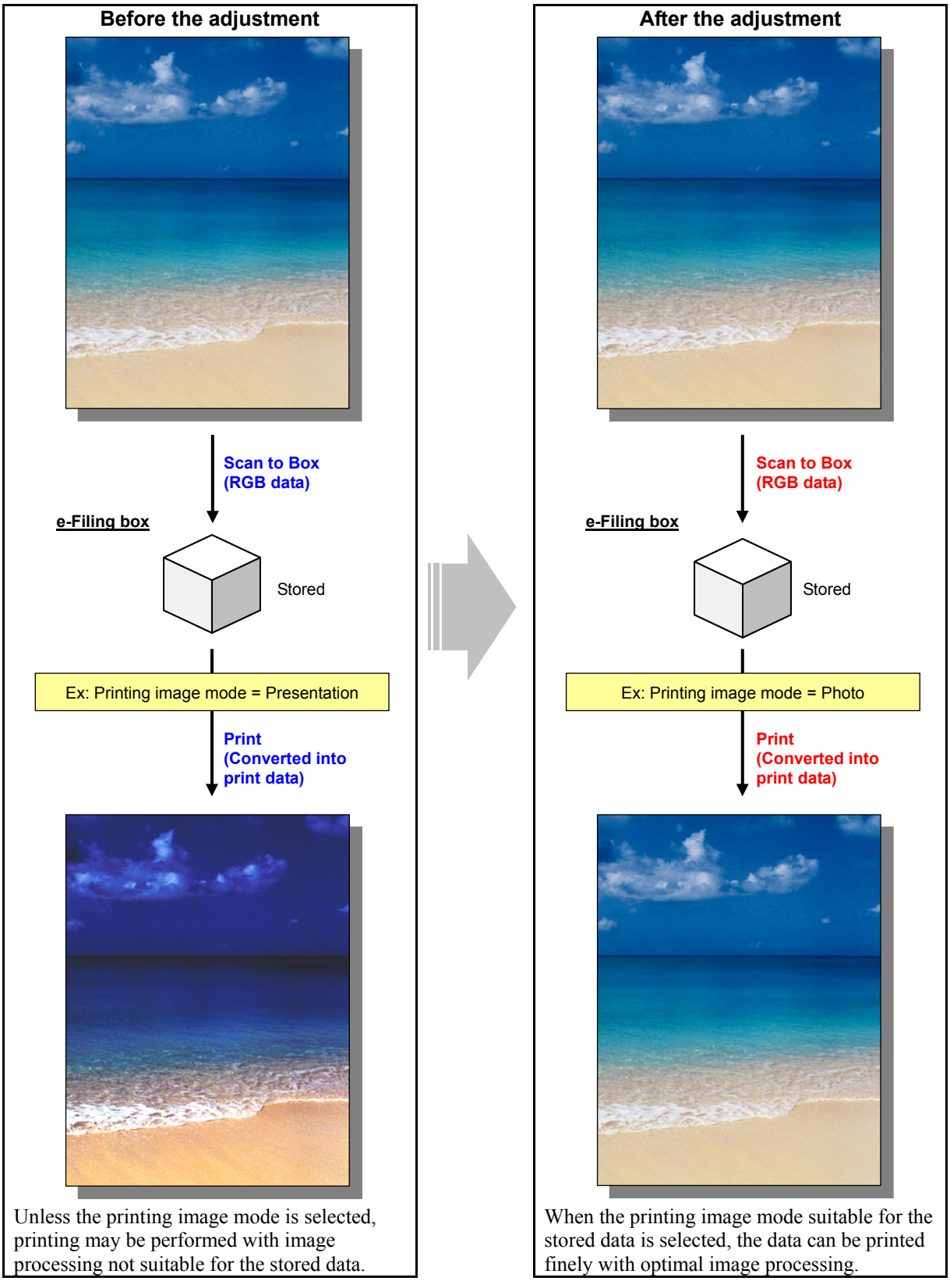
4.8 To Finely Print Color Images Scanned and Stored

(To print images stored through Scan to Box)


Before the adjustment
Scan to Box
(RGB data)
e-Filing box
Stored
Ex: Printing image mode = Presentation
Print
(Converted into
print data)
Unless the printing image mode is selected, printing may be performed with image processing not suitable for the stored data.
After the adjustment
Scan to Box
(RGB data)
e-Filing box
Stored
Ex: Printing image mode = Photo
Print
(Converted into
print data)
When the printing image mode suitable for the stored data is selected, the data can be printed finely with optimal image processing.

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❑ Explanation

When an image is scanned stored in the e-Filing box (Scan to Box) in the Full color or the Auto color mode, and printed as it is (without the printing image mode set), printing may be performed with image processing not suitable for the image, and the user may not obtain the desired image quality. To finely print a full-color image scanned and stored, select the printing image mode (General/Photograph/Presentation/Line Art) suitable for the image. Then, printing can be performed with image processing optimal for the image, in the same manner as printing on the printer driver.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Both the service technician and the user can perform all adjustments.

Scan to Box * This adjustment will have an effect only on the image stored in the Full color mode (including the Auto color mode).

(1) Scan the full-color image and store it in the e-Filing box.

* For further information regarding how to scan and store images, refer to the Operator's Manual for e-Filing Guide and Scanning Guide.

Scan to Box

(2) Select a printing image mode suitable for the stored image.

• Use steps (a) to (d) to change the printing image mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [USER] tab.
(c) Press the [E-FILING] button.
(d) Press the button for the mode suitable for the image in the [PRINTING IMAGE MODE] option.

* For further information regarding the features of each printing image mode, refer to the explanation of the "Image Quality Type" options in Procedure (1) of 3.3 To Obtain the Desired Color Balance.

<Note> A change to the printing image quality mode will apply to all future printouts using the e-Filing box. Carefully perform the adjustment while printing out images other than the one that is used for the adjustment.

Scan to Box

(3) Print out the image stored in the e-Filing box on the Control Panel or using the e-Filing Web utility.

* For further information regarding how to print it out, refer to the Oprator's Manual for e-Filing Guide.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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4.9 Appendix

* Perform the e-Filing setting according to the input and output methods of the data.

Chapter	Purpose	Input method	Output method
4.1	To scan black images more clearly in the Auto color mode.	Scan to Box	Displaying on a computer monitor
4.2	To scan an original while reducing its file size.	Scan to Box	Displaying on a computer monitor
4.3	To scan color photos while avoiding Moiré.	Copy to Box	Displaying on a computer monitor
4.4	To match the color balance of the scanned image to that of the original.	Print to Box	Displaying on a computer monitor
4.5	To scan and print originals while avoiding Moiré.	Scan to Box	Printing on paper
4.6	To print images stored in e-Filing boxes more clearly.	Copy to Box Print to Box	Printing on paper
4.7	To scan images optimal for image processing or to be displayed on a computer monitor.	Scan to Box	Displaying on a computer monitor
4.8	To print color images stored with the scanning function more clearly.	Scan to Box	Printing on paper

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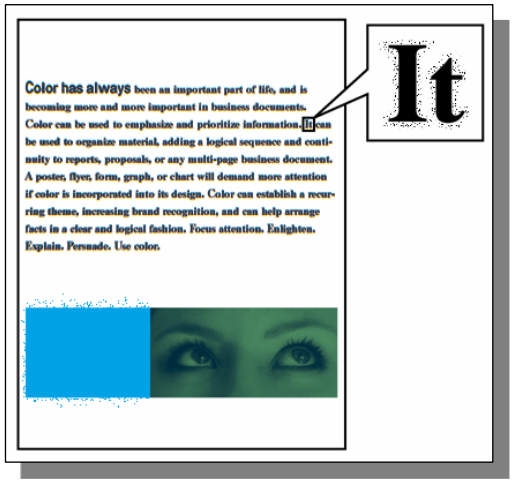
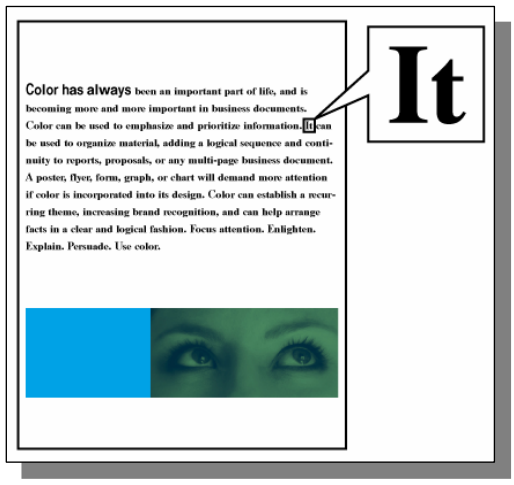
5.1 To Clearly Scan Text (To reduce noise around text)

Before the adjustment


Color has always been an important part of life, and is becoming more and more important in business documents. Color can be used to emphasize and prioritize information. It can be used to organize material, adding a logical sequence and continuity to reports, proposals, or any multi-page business document. A poster, flyer, form, graph, or chart will demand more attention if color is incorporated into its design. Color can establish a recurring theme, increasing brand recognition, and can help arrange facts in a clear and logical fashion. Focus attention. Enlighten. Explain. Persuade. Use color.
It

If the original is scanned in the Full color mode or the Gray scale mode, noise may occur in text or edges of a solid filled area.

After the adjustment


Color has always been an important part of life, and is becoming more and more important in business documents. Color can be used to emphasize and prioritize information. It can be used to organize material, adding a logical sequence and continuity to reports, proposals, or any multi-page business document. A poster, flyer, form, graph, or chart will demand more attention if color is incorporated into its design. Color can establish a recurring theme, increasing brand recognition, and can help arrange facts in a clear and logical fashion. Focus attention. Enlighten. Explain. Persuade. Use color.
It

The image quality is maintained, while noise is being reduced.

❑ Explanation

When an original is scanned in the Full color or the Gray scale mode, the data compression may cause noise (toner scattering) around text or the edges of a solid filled area. Adjust the compression rate or change the scan resolution, in order to obtain a better scanned-in image, while reducing noise.

* This adjustment will have an effect on the image scanned in the Full color mode (including the Auto color mode) or the Gray scale mode.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use this procedure. However, step (3) in the procedure must be performed only by the service technician.

(1) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "LOW" from among the compression rate options.
* [MID] is selected from among the compression rate options by default.

After changing the compression rate, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use procedure (2).

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(2) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select a higher resolution in the resolution option.
* "200 (dpi)" is selected from among the resolution options by default. If noise occurs in a resolution of 200 dpi, select a higher resolution (300 dpi, 400 dpi or 600 dpi).

After changing the resolution, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use procedure (1).

(3) Enter the setting mode [08]. Change the value for the code [8304] to change the JPEG compression ratio.

Compression ratio	[08] code	Subcode	Recommended value	Acceptable range value	Default
High quality	08-8304	0	Set a value smaller than 128 for higher compression ratio. Set a value larger than 128 for lower compression ratio.	0 to 255	128
Standard		1			
Low quality		2			

❑ Precautions after the completion of the adjustment

• The adjustment of the compression rate or resolution may possibly increase the size of the file to be stored. Therefore, carefully perform the adjustment, while checking the scanned-in image quality. The table below shows you the correlation between a resolution and file size. (The ratio of the file size may vary depending on the type of original. Therefore, use the table below just for your reference.)
* The file size in a resolution of 200 dpi is 1.

Resolution	File size ratio
200 dpi	1
300 dpi	Approx. × 2
400 dpi	Approx. × 3
600 dpi	Approx. × 8

• If the resolution selected in procedure (2) is too high, moiré may possibly occur in the scanned-in image. Therefore, carefully adjust the resolution, while checking the scanned-in image.

❑ Remarks

Use the following steps to change the default compression rate and resolution options:
(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [USER] tab.
(c) Press the [SCAN] button.
(d) In the " COMPRESS" or "RESOLUTION" option, press the button corresponding to the desired compression rate or resolution option.

* The default resolution can be selected on a color mode basis: Full color mode (including the Auto color mode), Gray scale mode and Black mode.
• The following resolution options are available as the default:
• Full color mode (including the Auto color mode): 600 / 400 / 300 / 200 / 150 / 100 (dpi)
• Gray scale mode: 600 / 400 / 300 / 200 / 150 / 100 (dpi)
• Black mode: 600 / 400 / 300 / 200 / 150 / 100 (dpi)

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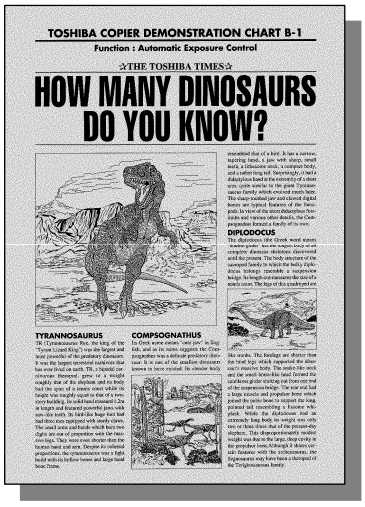
5.2 To Scan an Original, while Eliminating the Background Color

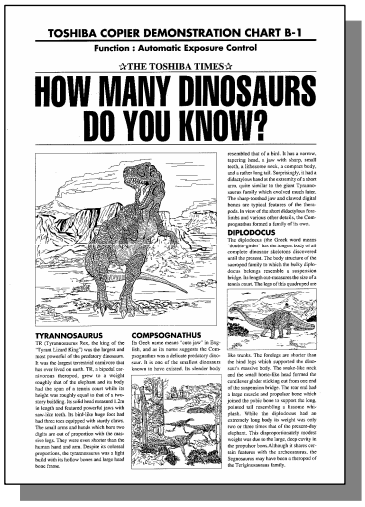
(To eliminate the background density)

Before the adjustment



The background color of the original is also scanned. Therefore, no clear contrast is made between the background and image.

After the adjustment



The background color is eliminated, allowing clear contrast between the background and image.

❑ Explanation

When an original with a background is scanned, such as a newspaper and colored paper, the background color is also scanned. Therefore, no clear contrast is made between the background and image. Perform background adjustment, in order to clearly scan such originals.

* This adjustment will have an effect on the image scanned in all color modes. However, the adjustment (procedure (3)) in adjustment mode [05] cannot be performed in the Gray scale mode and the Black mode.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedure (1) and (2).
* Only the service technician must use procedure (3).

(1) Set the density adjustment method to the automatic adjustment by pressing the [AUTO] button of the "EXPOSURE" option.

(2) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [◁] button to decrease the background density.

After decreasing the background density, scan the original and check the scanned-in image quality.
With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

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(3) Enter adjustment mode [05]. Change the values for codes [1070 to 1072] to decrease the background density.

• The code to use varies according to color mode and original mode. Adjust the value for [05] code corresponding to the color mode for which you would like to improve the image quality.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Full color	Text	05-1070	Set a value smaller than 50.	0 to 50	50
	Printed image	05-1071			
	Photo	05-1072			

* Set the value in increments of approximately 10, while checking the scanned-in image until the optimum value is obtained.

* The background density in the Full color mode (code 05-1070, 1071 or 1072) will become the lowest, if "0" is set. On the other hand, it will become the highest, if "50" is set. Changing the value will also change the background density in the Full color mode, when the "Background Adjustment" indicator is set to the center. Then, if the background density of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is decreased by 5 (lighter), the value of each step of the indicator will also be decreased by 5 (lighter)).

❑ Precautions after the completion of the adjustment

The adjustment may possibly diminish the quality of the light-colored image. Therefore, carefully perform the adjustment, while checking the scanned-in image.

❑ Remarks

When scanning the original, use the following steps to change the default indicator position in the background adjustment option, which is displayed on the Control Panel:

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [USER] tab.
(c) Press the [SCAN] button.
(d) Press the Next button twice to display the screen to change the default values in the Full color mode and the Auto color mode.
(e) Select the default background density in the "BACKGROUND ADJUSTMENT" option.

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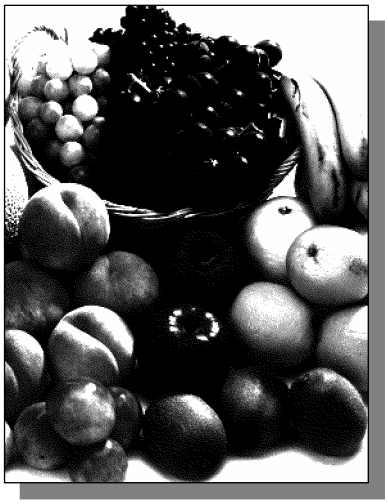
5.3 To Clearly Scan and Print an Original in Black and White

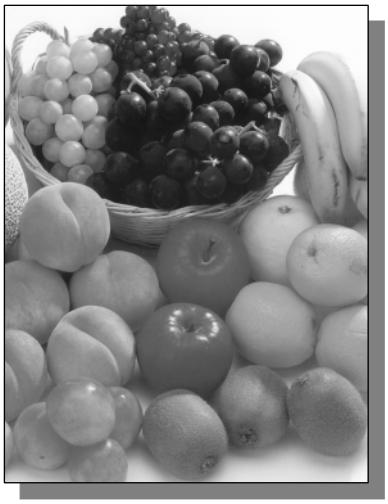
(To improve gradation and reduce graininess)

Before the adjustment



If the original is scanned in the Black mode, the halftones may become blurred in black.

After the adjustment



The halftones of the scanned-in image are clearly printed out.

❑ Explanation

If an original is scanned in the Black mode, a difference in the density level of the halftones cannot be accurately scanned. As a result, it may become blurred in black or grained. Scan a black-and-white original in the Gray scale mode, in order to scan and print it out in black and white more clearly.

❑ Procedures

*Both the service technician and the user can perform all adjustments.

(1) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "IMAGE SMOOTHING" from among the color mode options.

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❑ Precautions after the completion of the adjustment

The adjustment may possibly increase the size of the file to be stored. Therefore, carefully perform the adjustment, while checking the scanned-in image quality. The correlation between color mode and file size is as described below. (The ratio of the file size may vary depending on the type of original. Therefore, use the description below just for your reference.)

* Ratio of the file size in the Black mode to the Gray scale mode
  - If the file size in the Black mode with the Text mode selected is 1, it will be increased to approximately 7 times in the Gray scale mode.
  - If the file size in the Black mode with the Photo mode selected is 1, it will be approximately doubled in the Gray scale mode.

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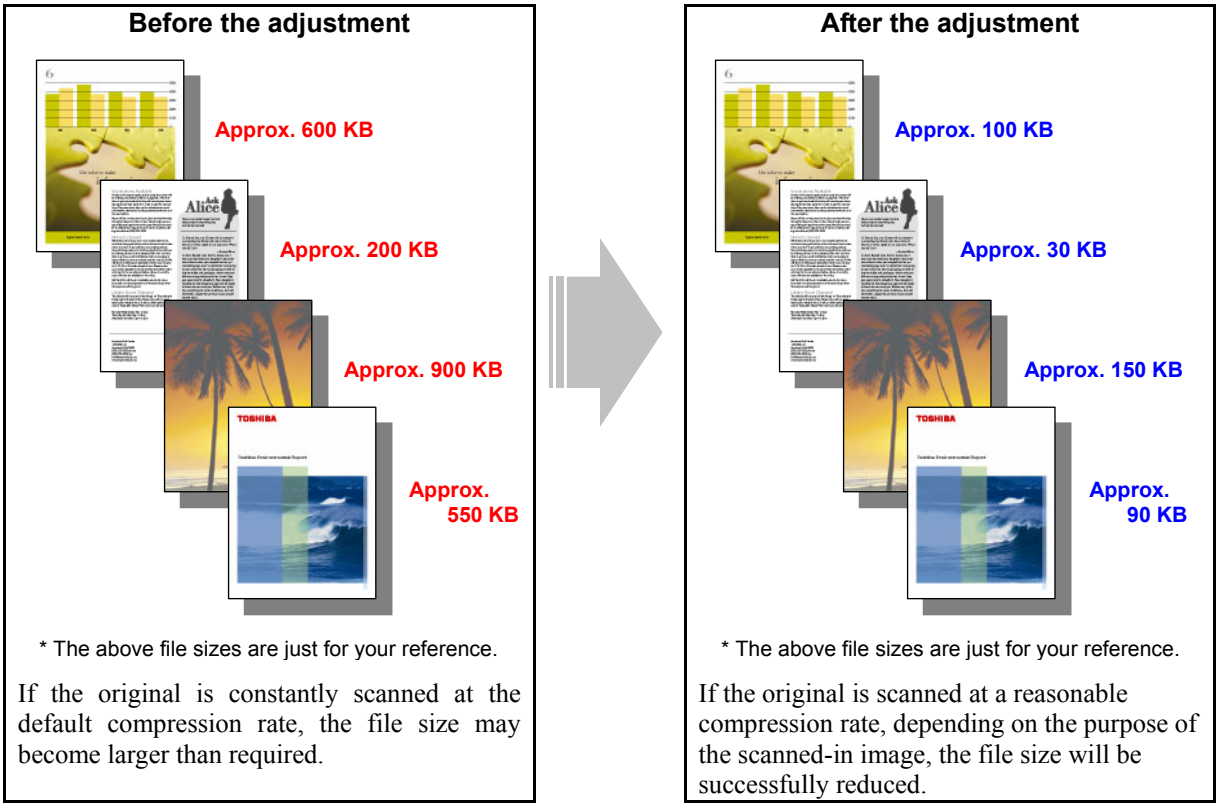
5.4 To Scan the Original, while Reducing the File Size


Before the adjustment
Approx. 600 KB
Approx. 200 KB
Approx. 900 KB
Approx. 550 KB
* The above file sizes are just for your reference.
If the original is constantly scanned at the default compression rate, the file size may become larger than required.
After the adjustment
Approx. 100 KB
Approx. 30 KB
Approx. 150 KB
Approx. 90 KB
* The above file sizes are just for your reference.
If the original is scanned at a reasonable compression rate, depending on the purpose of the scanned-in image, the file size will be successfully reduced.

❑ Explanation

If an original is scanned in the default resolution and at the default compression rate, a proper image will be obtained for general purposes. But the file size may become larger than required. The file size of the scanned-in image significantly varies, depending on the selected resolution or compression rate. If an appropriate resolution and a compression rate are selected in accordance with the purpose of the original, the image quality will be maintained, while the file size is being reduced. Change the resolution, original mode, or compression rate or perform the background adjustment, in order to minimize the file size of the scanned-in image.

The e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C offers the "Slim PDF" function. This will diminish the image quality but reduce the file size to approximately 1/8 to 1/10, compared to the scanned-in image (300dpi, compression rate: MID) in JPEG format.

❑ Procedures

* The procedure to use varies, depending on whether to reduce the file size by changing the options when scanning the original or in Slim PDF. Refer to "To Reduce the File Size by Changing the Options when Scanning the Original" in order to reduce the file size without changing the file format. Refer to "To Reduce the File Size in Slim PDF" in order to give a higher priority to the file size reduction than the image quality.

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5.4.1 To Reduce the File Size by Changing the Options when Scanning the Original

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use this procedure. However, step (5) in the procedure must be performed only by the service technician.

(1) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select a lower resolution in the resolution option.

* "200 (dpi)" is selected from among the resolution options by default. Select a lower resolution option (100 dpi or 150 dpi) to reduce the file size.
* This adjustment will have an effect on an image scanned in all color modes (Full color, Gray scale, Black and Auto color).

After changing the resolution, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use other procedures.

(2) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "TEXT" from among the original mode options.

* Perform this adjustment, only if a black-and-white original containing no photo images is scanned or if degradation in the photo image quality is acceptable.
* This adjustment will be effective, only if [TEXT/PHOTO] or [PHOTO] is initially selected from among the original mode options.
* This adjustment will have an effect only on an image scanned in the Black mode.

After changing original mode, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use other procedures.

(3) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "HIGH" from among the compression rate options.

* [MID] is selected from among the compression rate options by default.
* This adjustment will have an effect only on an image scanned in the Full color mode (including the Auto color mode) or the Gray scale mode.

After changing the compression rate, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use other procedures.

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(4) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [◐] button to decrease the background density. Then select "HIGH" from among the compression rate options.

* This adjustment will be effective, only if the original with a color background, such as a newspaper and color paper, is scanned.

* This adjustment will have an effect only on the image scanned in the Full color mode (including the Auto color mode) or the Gray scale mode.

After decreasing the background density and changing the compression rate, scan the original and check the scanned-in image quality.
With the background density set to the minimum, if further image quality adjustments are still necessary, use other procedures.

(5) Enter the setting mode [08]. Change the value for the code [8304] to change the JPEG compression ratio.

Compression ratio	[08] code	Subcode	Recommended value	Acceptable range value	Default
High quality	08-8304	0	Set a value smaller than 128 for higher compression ratio. Set a value larger than 128 for lower compression ratio.	0 to 255	128
Standard		1			
Low quality		2			

❑ Precautions after the completion of the adjustment

• The table below shows you the correlation between the adjustment and file size. (The ratio of the file size may vary, depending on the type of original. Therefore, use the table below just for your reference.)

• Correlation between the resolution and the file size (procedure (1))

* The file size in a resolution of 200 dpi is 100%.

Resolution	File size ratio
200 dpi	100%
150 dpi	Approx. 60%
100 dpi	Approx. 30%

• Correlation between the original mode and the file size (procedure (2))

* The file size in the Photo mode is 100%.

Original mode	File size ratio
Photo	100%
Text	Approx. 20%

• Correlation between the compression rate and the file size (procedure (3))

* The file size is 100%, with [MID] selected.

Compression rate	File size ratio
MID	100%
HIGH	Approx. 80%

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• The adjustment may possibly diminish the image quality, as shown by the table below. Therefore, carefully perform the adjustment, while checking the scanned-in image.

Procedures used	Possible image degradation
Any of procedures from (1) to (4)	The photo image area may be blurred.
(1) or (3)	Noise may be increase around text.
(1) or (3)	Small-sized text may become illegible.
(4)	Light-colored images may not be clearly scanned.

❑ Remarks

• Use the following steps to change the default resolution, original mode, compression rate and/or background adjustment options:

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] tab.

(c) Press the [SCAN] button.

(d) Press the Next button several times to display the screen to change the default value in the desired Color mode.

(e) In the "RESOLUTION," "ORIGINAL MODE," " COMPRESS" and/or "BACKGROUND ADJUSTMENT" option, press the desired button to change the default.

* The default resolution can be selected on a color mode basis: Full color mode (including the Auto color mode), Gray scale mode and Black mode

• The following resolution options are available as the default:

• Full color mode (including Auto color mode): 600 / 400 / 300 / 200 / 150 / 100 (dpi)

• Gray scale mode: 600 / 400 / 300 / 200 / 150 / 100 (dpi)

• Black mode: 600 / 400 / 300 / 200 / 150 / 100 (dpi)

• Remember that when scanning the original in the Full color mode, if the original mode option is switched from the Photo mode or the Printed image to the Text mode, the file size may become larger.

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5.4.2 To Reduce the File Size in Slim PDF

* Both the service technician and the user can use procedure (1).
* The service technician must use only procedure (2) in adjustment mode [05] (step (b) "To reduce the blurred area of text and photos"). Both the service technician and the user can use other procedures.

<Note>

- Slim PDF will be available only if "SCAN TO FILE OR USB" or "SCAN TO E-MAIL" is selected in scan mode to scan the original in the Full color mode or the Gray scale mode.

- The image quality or file size in Slim PDF may be more affected than in JPEG or PDF, depending on the environment (original placing direction) when the original is scanned. In addition, the scanning will be slowed down.

- Slim PDF is not suitable for the following originals. It is recommended to scan them in JPEG or PDF.
  - Originals blurred when scanned in JPEG or PDF
    (If the original is scanned in Slim PDF, the image quality may be further diminished)
  - Complicated originals such as tables or maps containing lines or small-sized text
  - Originals where stable image quality is required, such as critical documents

(1) When scanning the original, press the [SLIM PDF] button on the Control Panel.

After adjusting the original in Slim PDF, scan the original and check the scanned-in image quality.
If the image quality adjustment in Slim PDF is necessary, use the next procedure.

(2) Adjust the image quality in Slim PDF at a user's request.

To reduce the blurred area of text and photos

Use steps (a) to (b) to perform the adjustment.

(a) Turn the original and place it. Or when scanning the original, press the [COMMON SETTING] button on the Control Panel. Change the "Image Rotation" option to turn the original.

After changing the "Image Rotation" option, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, the service technician must use the next procedure.

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(b) Enter adjustment mode [05]. Change the values for code [9104] and [9107] to adjust the image quality and resolution of a background.

[05] code	Recommended value	Acceptable value range	Default
05-9104	5	0 to 10	5
05-9107	1 or 2	0 to 3	1

* Changing the value provides the effects below. Enter the value within the recommended value range. Otherwise, it may cause a loss in MFP performance, including degradation in the image quality.

Set a smaller value: High compression (small file size), low image quality, and high scanning speed

Set a later value: Low compression (large file size), high image quality, and low scanning speed

To leave the color of text as it is

Use steps (a) to (b) to perform the adjustment.

(a) Turn the original and place it. Or when scanning the original, press the [COMMON SETTING] button on the Control Panel. Change the "Image Rotation" option to turn the original.

After changing the "Image Rotation" option, scan the original and check the scanned-in image quality.

If further image quality adjustments are still necessary, use the next procedure.

(b) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Press the [-] button to decrease the sharpness intensity.

* Decrease the sharpness intensity by 1 step from the current value.

To eliminate the background density

Use steps (a) to (b) to perform the adjustment.

(a) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Press the [◁] button to decrease the background density.

After decreasing the background density, scan the original and check the scanned-in image quality.
Only if the user's desired image quality is still not obtained after the above procedure has been performed, scan the original in JPEG or PDF.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause blurred text, noise or vary the hues of areas. Therefore, carefully perform the adjustment, while checking the scanned-in image quality.

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5.5 To Sharply Scan the Original (To increase the sharpness intensity)

Before the adjustment

The image looks too soft and blurred.

After the adjustment

The edges are enhanced. The image looks sharp.

❑ Explanation

Adjust the sharpness intensity, in order to sharply scan the soft and blurred original.

* This adjustment will have an effect on the image scanned in all color modes (Full color, Gray scale, Black and Auto color).

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❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses the effectiveness of the adjustment, restore the settings made in the previously used procedure to the original ones. Then use other procedures.
* Both the service technician and the user can use procedure (1).
* Only the service technician must use procedure (2).

(1) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Press the [+] button to increase the sharpness intensity.

After increasing the sharpness intensity, scan the original and check the scanned-in image quality.
With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

(2) Enter adjustment mode [05]. Change the values for codes [1086 to 1088] and [840 to 843] to adjust the sharpness intensity.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Black	Text/Photo	05-840	Set a value larger than 128.	0 to 255	128
	Text	05-841			
	Photo	05-842			
Full color	Text	05-1086			
	Printed image	05-1087			
	Photo	05-1088			
Gray scale	---	05-843			

* Setting "0" provides the softest image, while setting "255" provides the sharpest image.

❑ Precautions after the completion of the adjustment

The adjustment may possibly cause moiré. In addition, when text and thin lines in a light-colored background are scanned, the background around the text or line may be eliminated. Therefore, carefully perform the adjustment, while checking the scanned-in image.

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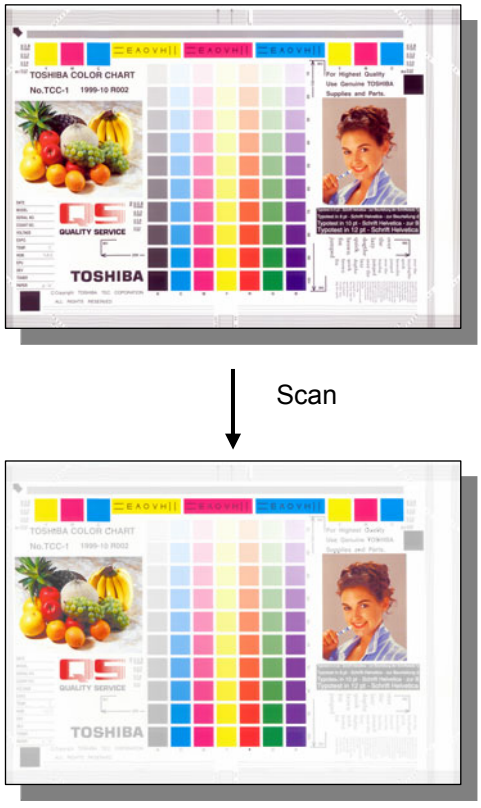
5.6 To Scan an Original, while Enhancing Black

Before the adjustment



Black is not dark enough, compared to the original.

After the adjustment

Black is enhanced and closely matched with the original hue.

❑ Explanation

When a full-color original is scanned, black is not dark enough, compared to the original. (In general, the scanned-in image is likely to become less dark.) Finely adjust the black density of the scanned-in image, in order to darken black and closely match it with the original hue.

* This adjustment will have an effect only on the image scanned in the Full color mode (including the Auto color mode).

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❑ Procedures

* The service technician must perform all adjustments.

(1) Enter adjustment mode [05]. Change the values for codes [1075 to 1077] to adjust the black density of a scanned-in image.

Color mode	Original mode	[05] code	Recommended value	Acceptable value range	Default
Full color	Text	05-1075	Set a value larger than 0.	0 to 4	0
	Printed image	05-1076			
	Photo	05-1077			

* Setting "0" provides the lightest black, while setting "4" the darkest.

❑ Precautions after the completion of the adjustment

The adjustment may possibly provide the extremely dark background. Therefore, carefully perform the adjustment, while checking the scanned-in image.

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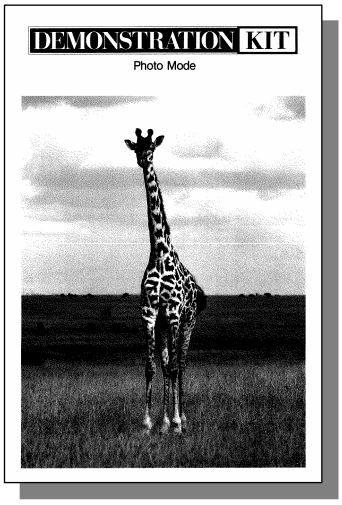
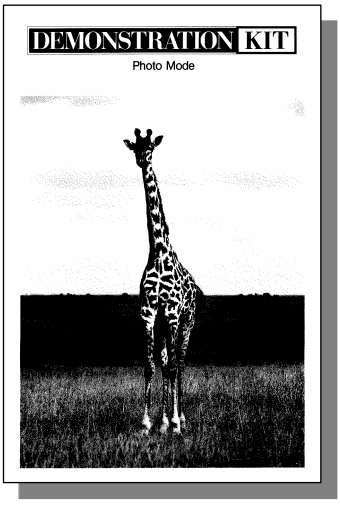
5.7 To Scan an Original with the Desired Gradation

Before the adjustment



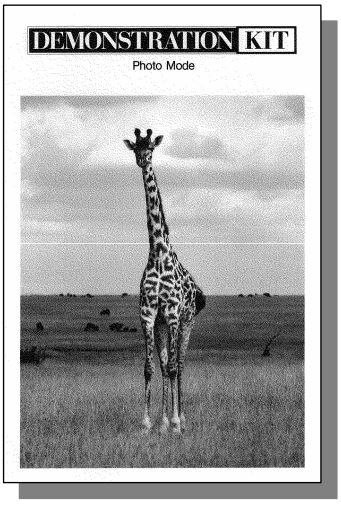
The image is scanned with natural gradation.
(Default scanning)

After the adjustment



Gradation is decreased.

After the adjustment



Gradation is increased.

❑ Explanation

When an original is scanned in the Black mode or the Gray scale mode, changing the scan density according to density area (low-, medium- or high-density area) allows a user to adjust the reproducibility of halftones (gradation). Adjust the gamma curve balance, in order to change the gradation, depending on the type of original or at a user's request.

* This adjustment will have an effect only on the image scanned in the Black mode or the Gray scale mode.

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❑ Procedures

* The service technician must perform all adjustments.

(1) Enter adjustment mode [05]. Change the values for codes [880 to 883] to adjust the gamma curve balance of the low-, medium- and high-density areas.

Color mode	Original mode	[05] code	Subcode	Recommended value	Acceptable value range	Default
Black	Text/Photo	05-880	0/1/2	Set a value smaller than 128 to decrease the density. Set a value larger than 128 to increase the density.	0 to 255	128
	Text	05-881	0/1/2			
	Photo	05-882	0/1/2			
Gray scale	---	05-883	0/1/2			

* Set the value in increments of approximately 20, while checking the scanned-in image until the optimum value is obtained.

* The subcode varies according to the area where the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area where the density is adjusted
0	Low-density area
1	Medium-density area
2	High-density area

* Gradation in the Black mode will vary, if the medium-density area is mainly adjusted. But remember that adjusting the low- or high-density area will rarely affect the gradation in the Black mode.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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5.8 To Register the Original Mode Optimal for a Particular Type of Original (To have "Custom" selected)

❑ Explanation

If the value for [05] code is adjusted in existing original mode (Text /Photo, Text, Photo, Printed image, Photo or Gray scale), in order to clearly scan a particular type of original, other types of original may not be clearly scanned. In this case, add the original mode option adjusted for a particular type of original as "Custom (User custom)" mode. To have "Custom" selected, add the value adjusted for [05] code in "Custom" mode to the one in reference original mode.

Select reference original mode for "Custom" from among the original mode options.

To have "Custom" in the Black mode, select the existing original mode option as reference original mode.

To have "Custom" in the Full color mode (including the Auto color mode) selected, select the existing original mode or "e-document" mode option where the value has been adjusted to identify whiteout areas, as reference original mode.

* This adjustment will have an effect only on the image scanned in the Black mode or the Full color mode (including the Auto color mode).

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Only the service technician must use procedures (1) and (2).
* Both the service technician and the user can use procedure (3).

(1) Enter setting mode [08]. Change the value for code [580] or [590] to select reference original mode for "Custom" mode from among the original mode options.

• Select the original mode option, which is most likely to be matched with the image quality the user desires.

For the Black mode

Value for 08-580	Reference original mode
0	Reserved (Default)
1	Text/Photo
2	Text
3	Photo

For the Full color mode

Value for 08-590	Reference original mode
0	Reserved (Default)
1	Text
2	Printed image
3	Photo
4	e-document

After selecting the reference original mode option, use the next procedure.

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(2) Enter adjustment mode [05] to adjust the values in the Custom mode, in order to obtain the image quality the user desires.

• Select the necessary value for [05] code in the table below.

Color mode	[05] code	Adjustment	Acceptable value range	Default
Black	05-7425	Range correction (Automatic density adjustment)	0 to 1	1
	05-7426	Range correction (Manual density adjustment)		0
	05-7470	Sharpness adjustment	0 to 255	128
	05-7475	Manual density adjustment center value		128
	05-7478	Automatic density adjustment		128
	05-7480	Gannma curve balance adjustment		128
	05-8371	Fine adjustment of black density	0 to 4	0
	05-8404	Background processing offset adjustment (Automatic density adjustment)	0 to 255	128
	05-8409	Background processing offset adjustment (Manual density justment)		128
Full color	05-8334	Range correction adjustment (Automatic density adjustment)	0 to 1	1
	05-8365	Range correction adjustment (Manual density adjustment)		0
	05-8370	Background adjustment	0 to 50	50
	05-8371	Fine adjustment of black density	0 to 4	0
	05-8372	RGB conversion method selection	0 to 3	0
	05-8373	Saturation adjustment	0 to 255	128
	05-8375	Sharpness adjustment		128
	05-8380	Manual density adjustment center value		128
	05-8381	Manual density adjustment light step value		20
	05-8382	Manual density adjustment dark step value		20
	05-8389	Backgraound processing offset adjustment (Automatic density adjustment)		128
	05-8394	Background processing offset adjustment (Manual density adjustment)		128

* For further information regarding the codes, refer to the Service Manual/Service Handbook.

<Note> Select the code for the Custom mode option, in order to adjust the value for [05] code in the Custom mode. Never adjust any values for [05] code in existing original mode.

After adjusting the value in the Custom mode, use the next procedure.

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(3) When scanning the original, press the [COMMON SETTING] button on the Control Panel. Select "Custom" from among the original mode options.

❑ Precautions after the completion of the adjustment

Nothing in particular.

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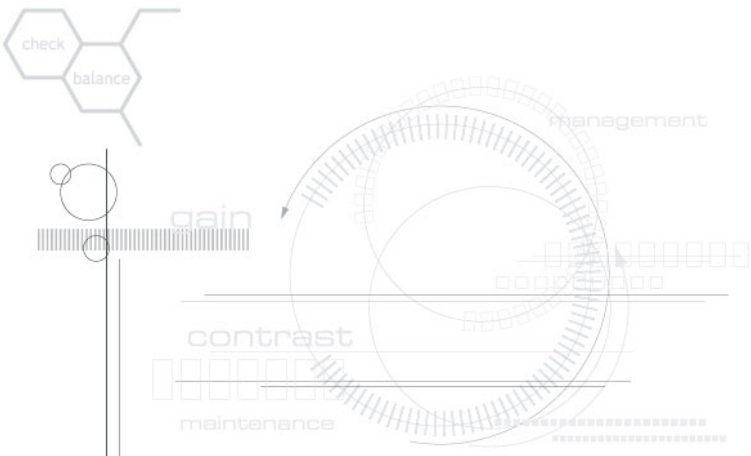

Imaging Manual

e-STUDIO2330c/2820c/2830c/ 3520c/3530c/4520c

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